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SCIENTIFIC THEORY

and

CATHOLIC DOCTRINE

BY

THE REVEREND J. A. ZAHM, Ph.D., C. S. C.

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Author of "Sound and Music," "Bible Science and Faith,"
"Catholic Science and Catholic Scientists,"
"Evolution and Dogma," etc.

*In necessariis unitas, in dubiis lib-
ertas, in omnibus caritas.*

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1896

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BY

J. A. ZAHM.



TO
MY POET FRIEND
MAURICE FRANCIS EGAN

PREFACE



THE present little work embraces my recent lectures before the Madison and Plattsburgh Summer Schools, and the Winter School of New Orleans. Aside from a few verbal changes, and a slightly different arrangement of the topics discussed, the subjects here treated retain their original form. The following chapters, it may also be remarked, cover essentially the same ground as Part II of my more extended work on "Evolution and Dogma." The chief, if not the sole, *raison d'être* of the lectures in their present form was a desire on the part of the patrons of the Columbian Catholic Summer School to have all the various lectures preserved in a series of uniform volumes or hand-books, which would be convenient for purposes of reference,

and would, at the same time, be a presentable souvenir of the work actually accomplished at the school's opening session.

Regarding the various strictures the lectures have evoked, I have little to say, and that for the simple reason that most of my critics, so far as my observation has extended, seem to have misapprehended entirely the position which I assumed, and to have attributed to me views which I as thoroughly reprobate as any one living. All reports to the contrary notwithstanding, I am neither a Darwinist nor a Huxleyan, for I have little faith in natural selection as a factor of Evolution, and I certainly entertain no more sympathy for Agnosticism than do the most severe of my critics. This does not, however, imply that I have found nothing good in the works of Darwin and Huxley, or that I have discovered nothing to admire in their wonderful researches and discoveries. But because I do not accept the scientific theory which gave Darwin such notoriety, and because I condemn the philosophical views of the cosmos which

secured such a vogue for Huxley, it does not follow that I am bound to reject all the conclusions of these eminent votaries of science, or that I must indulge in philippics against them whenever their names or theories are mentioned. The first duty of the man of science, as well as the first duty of the philosopher and the theologian, is to seek the truth wheresoever it may be found. The treasures of Tyre and Sidon were employed to beautify the temple of Jerusalem; the riches of pagan antiquity enhance the glory of Christian Rome.

That in the writings of the distinguished English naturalists just named, as well as in the writings of many of their followers, there is a great deal of truth; that their authors have contributed much, very much, towards a wider and a truer knowledge of nature and nature's laws, no one who is even slightly acquainted with the history of science can deny. That they fell into numerous errors in matters scientific, and advocated theories which are no longer tenable is equally true; but it

should never be forgotten in discussing the theories of men of science, that vituperation is not argument, that ridicule is not ratiocination, and that unfairness to an opponent is as illogical as it is unjust. The defenders of religion but weaken their cause by an indiscriminate onslaught on scientific theories, as the champions of science lay themselves open to suspicion, and prejudice their cause by uncalled-for diatribes against religion and the Church. Fortunately, such ill-advised representatives of science and faith are rapidly disappearing, and we may soon hope to see mooted questions of religion and science handled in that spirit of candor, moderation, and charity which should ever be dominant in all discussions that have for their ultimate object truth, and not controversial victory or the triumph of individual opinion. The sacredness of religion and the dignity of science demand from their true friends and advocates both dignified treatment and dispassionate statement. The absence of these prerequisites is sure to impair views one would wish to defend, and

sure also to damage conclusions proposed for the acceptance of those who may not be of our way of thinking.

In the subjects dealt with in the following pages there is, no doubt, much room for differences of opinion, as there has been room for differences of opinion for thousands of years past. But this is no reason why now, or at any other time, a matter of merely individual opinion should be put forward as a dogma of the Church, or as an article of scientific faith. Theories in science, as well as personal views respecting theology and Scripture, must stand or fall according as they are sustained or not sustained by irrefragable evidence. In the discussion, therefore, of all questions in which the Church, not self-constituted inquisitors, permits liberty of thought, we should never lose sight of the saying, consecrated by long usage: "In essential things, unity; in doubtful things, liberty; in all things, charity." If the truth embodied in this proposition were never lost sight of, many controversies, which are now fruitless, or which defeat their purpose, would result in untold

advantages to science as well as to religion, and would tend to bring the exponents of both the one and the other into friendlier relations, and would, at the same time, serve to remove misunderstandings which should never have existed.

Regarding the expediency of discussing the subject of Evolution before such audiences as are found at our Summer and Winter Schools, I can do no better than reproduce here what the Right Rev. S. G. Messmer, the learned and esteemed president of the Columbian Catholic Summer School, has said on the subject.

Writing to a paper which had found fault with a part of the programme of lectures at the school, he says: "Naturally, different heads entertain different ideas in this regard." And then, after replying to the objection which had been raised against the advisability of giving lectures on the origin of the Bible, the history of the Canon, and cognate subjects, he continues as follows:

"Similarly, the Holy Father has repeatedly expressed the desire that the

cultured classes be given clear evidence of the limitless, erroneous complications of so-called modern science, and of the harmony between the Church's doctrine and the incontestable data of the natural sciences. Dr. Zahm's lectures corresponded to this desire. It is simply silly to maintain that such questions are the exclusive prerogative of the secret circles of specialists and savants, since they are day after day brought before the general public by all manner of press products, newspapers, monthlies, books, and brochures, and are reasoned about by the masses. These very circumstances evince the manifest need of elucidating as much as possible, to at least the more or less educated circles, the religious and social significance of such scientific themes, and their relation to Christian belief."

The action of the directors of the Columbian Catholic Summer School in selecting Evolution and similar topics for discussion, had a precedent, if any were needed, in the example given by the International Catholic Scientific Congress of the Old World; a congress, which, it may be added, from its inception to the present day, has ever been under the watchful guidance of the

Sovereign Pontiff, Leo XIII, and which has counted, and still counts, among its patrons and members many of the most eminent Cardinals of the Sacred College. At the sessions of the congress at Paris in 1888 and 1891, the subject of Evolution was discussed with freedom and earnestness by both the laity and clergy. At the last meeting, at Brussels, it was felt on all hands that the time had come when it was necessary to determine the relation of Evolution to Catholic faith—"préciser l'état de la question au point de vue Catholique."

It was generally recognized that the principle of Evolution contains a great measure of truth, and that it, above all, possesses a special fascination for the young, and for students in colleges and universities. But it was also agreed that there is nothing in Evolution which should trouble the faith of Catholics, and nothing which justifies unbelievers in using the theory as an engine of war against the Church—"il ne faut pas que cette doctrine trouble la foi des croyants ne que les incrédules posent en évolutionistes pour faire pièce à

l'Église." And in order that a question of such general interest, and of such acknowledged importance might receive full and careful examination on the part of Catholics, the Rev. Padre Giovannozi, director of the astronomical observatory at Florence, Italy, proposed the following resolution as an expression of the attitude which should be assumed by the children of the Church regarding the question of Evolution:

"The section of Anthropology of the Third International Catholic Scientific Congress, assembled at Brussels, praises and encourages the studies of those who, under the supreme magisterium of the Church teaching, devote themselves to investigating the rôle which Evolution has had in concert with the second causes that have brought the physical world into its present condition."

This resolution was not only passed, but passed amid general acclamation.

If, then, it is the Holy Father's expressed desire that the children of the Church should devote themselves to the study of the mutual relations of science and faith; if the most learned Catholic associaton in the world deemed it wise

and opportune to pass a special resolution favoring a more thorough investigation of the status and claims of Evolution; if, in fine, it is most reasonable that Catholics should not be ignorant of a subject of such paramount importance as is the theory of Transformism, it is difficult to understand why, in certain quarters, there should lately have been such a hue and cry raised against a frank and honest discussion of Evolution and other kindred topics.

Judging from my own experience, and it is not inconsiderable, false notions respecting current evolutionary theories have effected far more mischief among the faithful than is ordinarily supposed. By the press and from the rostrum such theories are discussed continually; they come up constantly in the school, the club, the drawing-room and the railroad car. Catholics must, therefore, take part in the discussion of these theories and of their bearing on revealed truth. And such being the case, it is in the highest degree desirable, nay, more, it is necessary, for them to be prepared to acquit themselves creditably in debates

which are so frequent and so unavoidable.

But where are they to get reliable information on the subjects in question? Where are they to find answers to the many specious objections daily urged against their faith in the name of recent science and discovery? Surely not from those who are inimical to the Church and her teachings; not certainly from those who do not believe in God and in a future life; not from the apostles of infidelity, Naturalism, and Atheism; not from those who believe, or affect to believe, that there is an irreconcilable antagonism between nature and the Bible, between science and revelation. Where, then, are they to seek for guidance in their doubts and difficulties? Where are they to find materials which will be available in instruction and controversy? From Catholics who have made a special study of the topics which we are considering? But, then, it is objected that the discussion of such subjects on the part of Catholics is inexpedient and inopportune. The absurdity of the objection is its best refutation.

Where, indeed, could the all-important question of Evolution be discussed more effectively and more profitably than before a large and intelligent body of the clergy and laity, such as assemblies at our Summer and Winter Schools? Here are teachers from parochial schools; professors from academies and colleges; men and women from the various walks of life, who stand in special need of accurate knowledge, from a Catholic point of view, respecting questions they are so frequently called upon to answer. Ours, then, is the duty to supply the information sought for, as far as in us lies; to show that there is a sense in which Evolution can be accepted by all Catholics; that there is nothing in the theory, so far as it is based on unassailable evidence, which contravenes any doctrine of the Church, or contradicts any of the explicit declarations of Holy Writ, or renders less noble or less elevating the idea that Christians have ever entertained regarding "God the Father, Almighty, Creator of heaven and earth." How far my humble attempt in this direction may be calculated to attain

the purpose in view, I leave to the reader to judge. What I can truly say is that this little work has been inspired by the best of intentions, or, as the old French writer quaintly phrased it: "Ceci est ung livre de bonne foy," and as such I now send it forth to the reading public.

J. A. ZAHM, C.S.C.

NOTRE DAME UNIVERSITY,
March 7, 1896.

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CHAPTER I.

NATURE AND SCOPE OF EVOLUTION.

Early Speculation Regarding Nature and Man.

FROM time immemorial philosophers and students of nature have exhibited a special interest in all questions pertaining to the origin of man, of the earth on which he lives and of the universe to which he belongs. The earliest speculations of our Aryan forefathers were about the beginnings of things. Questions of cosmology, as we learn from the tablets preserved in the great library of Assurbanipal in Nineveh, received their meed of attention from the sages of ancient Assyria and Babylonia. And long before Assyria, Babylonia and Chaldea had reached the zenith of their power, and before they had attained that intellectual eminence which so distinguished them among the nations of the ancient world, the peoples of Accad and Sumer had raised and

discussed questions of geogony and cosmogony. They were a philosophical race, these old Accadians and Sumerians, and, as we learn from the records which are constantly being exhumed in Mesopotamia, they had a breadth of view and an acuteness of intellect, which, considering their environment and the age in which they lived, were simply astonishing. Well have they been called "the teachers of Greece," for all the subtlety of thought and keenness of perception, all the love of science, art and letters, which were so characteristic of the Greek mind, were possessed in an eminent degree by those old pre-Babylonian masters who thought and taught and wrote many long generations before Abraham left Ur of the Chaldees, untold centuries before Thales taught and Homer sang. And the musings of the mystic Hindu along the banks of the Indus and the Ganges ; the meditations of the Egyptian priest in the temples of Memphis and Heliopolis ; the speculations of the wise men of Attica and Ionia, all turned more or less on the same topics which possessed such a

fascination for the sages of old Chaldea, and which were discussed with such zest in the schools of Nineveh and Babylon.

Whence are we? Whither are we going? Whence this earth of ours and the plants and animals which make it their home? Whence the sun, and moon and stars—those distant and brilliant, yet mysterious representatives of our visible universe? Did they have a beginning, or have they existed from all eternity? And if they had a beginning, are they the same now as they were when they first came into existence, or have they undergone changes, and, if so, what are the nature and the factors of such changes? Are the development and mutations of things to be referred to the direct and immediate action of an all-powerful Creator, or are they rather to be attributed to the operation of certain laws of nature—laws which admit of determination by human reason, and which, when known, serve as a norm in our investigations and experiments in the organic and inorganic worlds? Are there special interventions on the part of a

Supreme Being in the government of the universe, and are we to look for frequent, if not constant, exhibitions of the miraculous in the natural world? Has God's first creation of the universe and all it contains, of the earth and all that inhabits it, been followed by other creations at divers periods, and if so, when and where has such creative power been manifested?

These are a few of the many questions about the genesis and development of things which men asked themselves in the infancy of our race. And these are questions which philosophers are still putting to themselves, and which, notwithstanding the many thousands of years during which they have been under discussion, have to-day a greater and more absorbing interest than in any former period of human history.

It is beside my present purpose to enumerate the various theories in science to which the discussion of the questions just propounded has given rise, or to dwell on the divers systems of philosophy and religion which have been the natural outgrowth of such or similar

discussions. Materialism, Pantheism, Emanationism, Hylozoism, Traducianism, Atheism and other isms innumerable have always been, as they are to-day, more or less closely identified with many of the speculations regarding the origin and constitution of the visible universe. And despite the great advances which have been made in our knowledge of nature and of the laws which govern the organic and inorganic worlds, many of the questions which so agitated the minds of the philosophers of the olden time, are still as far from solution as they were when first proposed. New facts and new discoveries have placed the old problems in a new light, but have diminished none of their difficulties. On the contrary, the brilliant search-light of modern science has disclosed new difficulties which were before invisible, and proved that those which were considered before are in many respects far graver than was formerly imagined. With the advance of science, and the progress of discovery, many problems, it is true, find their solution, but others, hydra-like, arise in

their place and obtrude themselves on the scientist and philosopher, and will not down until they have received due recognition.

Comprehensiveness of Evolution.

To answer some, if not all, of the questions just alluded to ; to explain the phenomena of the cosmos ; to solve the problems of life and mind, and throw light on the beginning and development of things, recourse is now had to a system of philosophy and science which, within the last few decades, has attained a special vogue under the name of Evolutionism, or, as its adepts prefer to call it, Evolution. Evolution, we are assured, is the magic word which explains all difficulties ; the “ open sesame ” which admits us into the innermost arcana of nature. We are told of the Evolution of the earth, of the Evolution of the solar system, of the Evolution of the sidereal universe. Men discourse on the Evolution of life, the Evolution of the organic and inorganic worlds, the Evolution of the human race. We have similarly the Evolution of society, gov-

ernment, religion, language, art, science, architecture, music, literature, chemistry, physics, mathematics, and the various other branches of knowledge as well. We now talk of the Evolution of the steamboat, the locomotive, the dynamo, the machine-gun, the telescope, the yacht and the bicycle. All that ministers to comfort, luxury and fashion are objects of Evolution. Hence it is that we hear people speak of the Evolution of the modern house-furnace and the cooking-stove; the Evolution of the coach and the dog-cart; the Evolution of seal-skin sacques, high-heeled shoes and of that periodically recurrent *bête noire* of fond husbands and indulgent papas, the latest pattern of a lady's hat. Anything which has developed or improved—and what has not?—is spoken of as having come under the great law of Evolution, and, presto! all is explained, and any little enigmas which before may have existed instantly vanish.

As is evident from the foregoing, Evolution may mean a great deal, or it may mean little or nothing. It is

manifestly a term of very general application and may often be very misleading. Properly understood it may be of signal service to the searcher after truth, while, on the contrary, if it is constituted an ever-ready *deus ex machina*, capable of solving all difficulties, it may lead to inextricable confusion and tend to obscure what it was designed to illumine. It is obvious, too, that we must restrict the meaning of the word Evolution, for it does not come within the scope of our work to speak of Evolution in general. We have to consider only a particular phase of it, and for this purpose it is important to have a definition of what is meant by Evolution.

Evolution Defined.

Herbert Spencer, who is regarded by his admirers as the great philosopher of Evolution, defines it to be a "change from an indefinite, incoherent homogeneity, to a definite, coherent heterogeneity; through continuous differentiations and integrations."

"And the operation of Evolution," continues the same authority, "is abso-

lutely universal. Whether it be in the development of the earth, in the development of life upon its surface, in the development of society, of government, of manufactures, of commerce, of language, of literature, science, art, this same advance from the simple to the complex, through successive differentiations, holds uniformly. From the earliest traceable cosmical changes down to the latest results of civilization, we shall find that the transformation of the homogeneous into the heterogeneous, is that in which Evolution essentially consists."

Spencer's definition, however, exact as it may be deemed, embraces far more than we shall have occasion to consider, for my task shall be confined to the Evolution of the earth and its inhabitants, and only incidentally shall I refer to cosmic Evolution. Indeed, properly speaking, the Evolution of which I shall treat shall be limited almost entirely to organic Evolution, or the Evolution of the plants and animals which live or have lived on this earth of ours. All references, therefore; to the Evolution of the earth itself from its primeval nebulous state, and to the Evolution of organic from inorganic matter, will be

mostly by way of illustration, and in order to show that there is no breach of continuity between organic Evolution, which is my theme, and inorganic or cosmic Evolution.

Literature of Evolution.

The subject is a vast one, and to treat it adequately would require far more space than I have at my disposal. It has indeed a literature and a bibliography of its own—a literature whose proportions are already stupendous, and are daily, and with amazing rapidity, becoming more colossal. For the past third of a century, since the publication of Darwin's "Origin of Species," it has been uppermost in the minds of everyone given to thinking on serious subjects. Everybody talks about Evolution, and more write about it than about any other one subject.

Such being the case, it will evidently be impossible for me to do more than briefly indicate the status of Evolution to-day in the world of thought, religious, scientific and philosophic. It is something that one cannot develop *dans un*

mot, as a certain French lady expected of a noted savant, when asking him to explain his system of philosophy. For a similar reason, also, I can discuss but briefly the bearings of Evolution on religion and Catholic dogma. I shall, therefore, have to limit myself to a few general propositions, and refer those who desire a more exhaustive treatment of the subjects discussed, to the many elaborate and learned works that have been given to the world during the past few decades.

Freedom from Bias in the Discussion of Evolution.

I may here be permitted, before going further, to remind the reader that it is of prime importance, in the discussion of the subject of Evolution, especially in its relation to religion and dogma, for one to weigh fairly and dispassionately the arguments and objections of evolutionists, and to divest one's self of all bias that may proceed from prejudice or early education, to consider the question on its merits, and not to let one's mind be swayed by preconceived, or it may

be, by erroneous notions. Let the value of the evidence adduced be estimated by the rules of logic and in the light of reason. This is essential. In the discussion of the subject during the past thirty and odd years much has been said in the heat of controversy, and on both sides, that had no foundation in fact. There have been much exaggeration and misrepresentation, which have given rise to difficulties and complications that might easily have been avoided if the disputants on both sides had always been governed by a love of truth, and the strict rules of dialectics, rather than by passion and the spirit of party. Misguided zeal and ignorance of the true teachings of the Church, always betray one into making statements which have no foundation in fact, but, in the discussions to which the subject of Evolution has given rise, there has often been exhibited, by both the defendants and the opponents of the theory, a lack of fairness and a bitterness of feeling that are certainly not characteristic of those whose sole desire is the attainment of truth. Such polemics have injured both parties,

and have delayed a mutual understanding that should have, and would have been reached years ago if the ordinary rules of honest controversy had always been inviolably observed.

Now that the smoke of battle is beginning to vanish, and that the participants in the contest have time to reckon results and to look back to the causes which precipitated the struggle, it is found, and I think generally conceded, that certain of the representatives of science were the ones who brought on an imbroglio for which there was not the slightest justification. But it is the old story over again: hatred of religion concealed behind some new discovery of science or enveloped in some theory that, for the nonce, was raised to the dignity of an indisputable dogma. It was not, it is true, so much the chief representatives of science who were to blame as some of their ill-advised *asseclæ*, who saw in the new teachings an opportunity of achieving notoriety, and, at the same time, of venting their spleen against the Church and casting obloquy on religion and Scripture.

CHAPTER II.

MISCONCEPTIONS OF THEORY, ERRORS IN DOCTRINE AND MISTAKES IN TERMINOLOGY.

Evolution and Darwinism.

THE question now is: How are we to envisage the process of Evolution, and what limits are we to assign to it? Is it as universal in its action as it is usually claimed to be, or is the sphere of its activity restricted and confined within certain definite, fixed limits, beyond which it may not extend? And then, a far more important question comes to the fore, and that is, how is faith affected by Evolution, or in other words, what is the attitude of Dogma towards Evolution?

To this last question various answers have been given, many of them contradictory, more of them absurd, few of them satisfactory or philosophical. All

remember the storm that was raised against Darwinism on its first appearance, a few decades ago. Darwinism, however, is not Evolution, as is so often imagined, but only one of the numerous attempts which have been made to explain the *modus operandi* of Evolution. Nevertheless, for a long time Darwinism and Evolution were regarded as synonymous—as in the popular mind they are still synonymous—even by those who should have been better informed. The objections which were advanced against Darwinism were urged against Evolution, and *vice versa*. And in most of the controversies relating to these topics there was a lamentable, often a ridiculous, ignorance of the teachings of the Church, and this, more than anything else, accounts for the *odium theologicum*, and the *odium scientificum*, which have been so conspicuous in religious and scientific literature during the past third of a century.

During the first few years after the publication of "The Origin of Species," there were but few, even among professed men of science, who did not

condemn Darwinism as irreligious in tendency, if not distinctly atheistic in principle. "Materialistic" and "pantheistic," were, however, the epithets usually applied both to Evolution and the theory so patiently elaborated by Darwin. Prof. Louis Agassiz, as we have already seen, did not hesitate to denounce "the transmutation theory as a scientific mistake, untrue in its facts, unscientific in its method, and mischievous in its tendency." Certain others of Darwin's critics characterized his theory as "an acervation of endless conjectures," as an "utterly rotten fabric of guess and speculation," and reprobated his "mode of dealing with nature" as "utterly dishonorable to natural science," and as contradicting "the revealed relation of the creation to its Creator."

Darwinism was spoken of as "an attempt to dethrone God;" as "the only form of infidelity from which Christianity has anything to fear;" as doing "open violence to everything which the Creator Himself has told us in the Scriptures of the methods and results

of His work." It was declared to be "a dishonoring view of nature;" "a jungle of fanciful assumption;" and those who accepted it were said to be "under the frenzied inspiration of the inhaler of mephitic gas." "If the Darwinian theory is true," averred another, "Genesis is a lie, the whole framework of the Book of Life falls to pieces, and the revelation of God to man, as we Christians know it, is a delusion and a snare."

Evolution naturally shared in the denunciations hurled against Darwinism. It was designated as "a philosophy of mud;" as "the baldest of all the philosophies which have sprung up in our world;" as "a flimsy framework of hypothesis, constructed upon imaginary or irrelevant facts, with a complete departure from every established canon of scientific investigation." It was stigmatized as "flatly opposed to the fundamental doctrine of creation," and as discharging God "from the governing of the world." The distinguished Canadian geologist, Sir J. W. Dawson, in speaking of the subject, affirms that "the doctrine [of Evolution] as carried

out to its logical consequences excludes creation and Theism. It may, however, be shown, that even in its more modified forms, and when held by men who maintain that they are not atheists, it is practically atheistic, because excluding the idea of plan and design, and resolving all things into the action of unintelligent forces."

Evolution, Atheism and Nihilism.

To judge from the declarations of some of the most ardent champions of Evolution, it must be admitted that orthodoxy had reason to be at least suspicious, of the theory that was heralded forth with such pomp and circumstance. For it was announced with the loudest flourish of trumpets, not only that Evolution is a firmly established doctrine, about whose truth there can no longer be any doubt, but it was also boldly declared, by some of its most noted exponents, to be subversive of all religion and of all belief in a Deity. Materialists, atheists, and anarchists the world over, loudly proclaimed that there is no God, because, they would

have it, science had demonstrated that there is no longer any *raison d'être* for such a Being. Evolution, they claimed, takes the place of creation, and eternal, self-existent matter and force exclude an omnipotent personal Creator. "God," we are told, "is the world, infinite, eternal, and unchangeable in its being and in its laws, but ever-varying in its correlations." A glance at the works of Hæckel, Vogt, Büchner, and others of this school, is sufficient to prove how radical and rabid are the views of these "advanced thinkers."

It was in consequence of the circulation of such views among the masses, that Virchow and others declared Evolution responsible, not only for the attempts made by Hödel and Nobeling on the life of the German Emperor but also for all the miseries and horrors of the Paris Commune. For the theory of Evolution, in its atheistic form, is one of the cardinal tenets of nihilists, and their device is: "Neither God, nor master," *Ni Dieu, ni maître*. It is at the bottom of the philosophy of the Krapotkins and Réclus, who "see in the

hive and the ant-hill the only fundamental rule of right and wrong, although bees destroy one class of their number and ants are as warlike as Zulus." And we all remember how Vaillant, the bomb-thrower in the Chamber of Deputies, boastfully posed as the logical executant of the ideas of the Darwins and the Spencers, whose teachings, he contended, he was but carrying out to their legitimate conclusions.

Evolution and Faith.

But all evolutionists have not entertained, and do not entertain, the same opinions as those just mentioned. America's great botanist, Prof. Asa Gray, was not so minded. One of the earliest and most valiant defenders of Darwinism, as well as a professed Christian believer, he maintained that there is nothing in Evolution, or Darwinism, which is incompatible with Theism. In an interesting chapter on Evolution and Theology, in his "Darwiniana," he gives it as his opinion, arrived at after long consideration, that "Mr. Darwin has no atheistical intent, and that, as respects

the test question of design in nature, his view may be made clear to the theological mind by likening it to that of the believer in general, but not in particular, Providence." So far, indeed, was Darwin from having any "atheistical intent," that when interrogated regarding certain of his religious views he replied : "In my most extreme fluctuations I have never been an atheist in the sense of denying the existence of God." And the late Dr. McCosh declared, that he had "never been able to see that religion, and in particular that Scripture, in which our religion is embodied, is concerned with the absolute immutability of species."

The illustrious Dominican *conférencier*, Father Monsabré, records it as his opinion that the theory of Evolution, "far from compromising the orthodox belief in the creative action of God, reduces this action to a small number of transcendent acts, more in conformity with the unity of the Divine plan and the infinite wisdom of the Almighty, Who knows how to employ secondary causes to attain His ends." This is in

keeping with the view of the distinguished German Catholic writer, Doctor C. Güttler, who asserts that "Darwin has eliminated neither the concept of creation, nor that of design; that, on the contrary, he has ennobled both the one and the other. He does not remove teleology, but merely puts it farther back."

Evolution and Science.

But there are yet others to be heard from. According to Huxley, who is an avowed agnostic, the "doctrine of Evolution is neither anti-theistic nor theistic. It simply has no more to do with Theism than the first book of Euclid has." It will be observed that with Huxley, Evolution is neither a hypothesis nor a theory, but a doctrine. So is it with many others of its advocates. It is no longer something whose truth may be questioned, but something which has been established permanently on the solid foundation of facts. It has, we are assured, successfully withstood all the ordeals of observation and experiment, and is now to be counted among those acquisitions of science which

admit of positive demonstration. Thus, a few years ago, in an address before the American Association for the Advancement of Science, Prof. Marsh said:

“I need offer no argument for Evolution, since to doubt Evolution is to doubt science, and science is only another name for truth.”

“The theory of Evolution,” writes M. Ch. Martins, in the *Revue de Deux Mondes*, “links together all the questions of natural history, as the laws of Newton have connected all the movements of the heavenly bodies. This theory has all the characters of Newtonian laws.”

Prof. Joseph Le Conte, however, goes much further:

“We are confident,” he declares, “that Evolution is absolutely certain, not indeed Evolution as a special theory—Lamarckian, Darwinian, Spencerian—but Evolution as a law of derivation of forms from previous forms; Evolution as a law of continuity, as a universal law of becoming. In this sense it is not only certain, it is axiomatic.”

Ignorance of Terms.

But, wherefore, it may be asked, have we such diverse and conflicting opinions

regarding the nature and tendency of Evolution? Why is it that some still persist in considering it a "flimsy hypothesis," while others as stoutly maintain that it is a firmly established doctrine? Why is it that some believe it to be neutral and indifferent, so far as faith is concerned, and others find in its tenets illustrations and corroborations of many of the truths of Dogma; that there are so many who see, or fancy they see in it, the negation of God, the destruction of religion, and the subversion of all order, social and political? These are questions which are frequently asked, and that press themselves upon even the most superficial reader. Are they insoluble? Must they be relegated forever to the domain of paradox and mystery, or is there even a partial explanation to be offered for such clashing opinions and such glaring contradictions? With all due deference to the judgment of those who see nothing good in Evolution, nothing which must not incontinently be condemned as false and iniquitous; I think that the enigma may be solved, and that it may be shown that

the contradictions, as is usually the case in such matters, are due mostly, if not wholly, to an *ignoratio elenchi*, a misapprehension of terms, or to a deliberate intention of exploiting a pet theory at the expense of religion and Dogma, which are ostentatiously repudiated as based on superstition and falsehood.

The two words most frequently misunderstood and misemployed are "creation" and "nature." They are of constant occurrence in all scientific treatises, but no one who is not familiar with the writings of modern evolutionists has any conception of the extent to which these terms are misapplied. For this reason, therefore, it is well, before proceeding further, briefly to indicate the meaning which Catholic theology attaches to these much-abused words.

Materialism and Dualism.

From the earliest times, the dogma of creation has been a stumbling-block to certain students of science and philosophy. The doctrines, however, which have met with most general acceptance regarding the origin and constitution of

the universe, can be reduced to a few typical and comprehensive classes.

First of all, comes the Materialism of Leucippus and Democritus, of Heraclitus, and of Empedocles, of Epicurus and the philosophers of the Ionian school. The only reality they recognized was matter. Simple atoms, infinite in number, eternal and uncreated, moving eternally in a void infinite in extent, are, of themselves, the only postulate demanded by materialists to explain the universe and all the phenomena which it exhibits. It excludes the intervention of an intelligent cause, and attributes all life and thought to the mere interaction of the ultimate atoms of brute matter. Morality, according to this teaching, is but "a form of the morality of pleasure," religion is the outcome of fear and superstition, and God the name of a being who has no existence outside of the imaginations of the ignorant and the self-deceived.

Materialism, as is obvious, is but another name for Atheism, and is a blank negation of creation as well as of God.

“Rigorously speaking,” M. Caro well observes, “Materialism has no history, or, at least, its history is so little varied that it can be given in a few lines. Under what form soever it presents itself, it is immediately recognized by the absolute simplicity of the solutions which it proposes. Contemporary Materialism has in nowise changed the framework of this philosophy of twenty centuries’ standing. It has never deviated from its original program; it has but been enriched with scientific notions; it has been transformed in appearance only, by being surcharged with the data, the views, the hypotheses, infinite in number, which are the outgrowth of the physical, chemical, and physiological sciences. Democritus would easily recognize his teaching, if he were to read the works of M. Büchner; even the language used has undergone but a trifling change.”

Indeed, “the history of Materialism,” as has well been remarked, “may be reduced to indicating the influence which it has exercised at divers epochs, and to recording the names of its most famous representatives.”

The advocates of Dualism, like the defenders of Materialism, taught the

eternity of matter, but in addition to eternal, uncreated matter, recognized the existence of a personal God. Many of the philosophers of antiquity, who escaped the errors of Materialism and Pantheism, fell headlong into those of Dualism, which possessed as many forms as Proteus himself. Thus, the Manicheans asserted the existence of two principles, one good, the other evil; the former the creator of souls, the latter the creator of bodies. According to the gnostics the world is the work of the angels, and not the immediate result of Divine creative action. Even according to J. Stuart Mill, matter is uncreated and eternal. God, he will have it, but fashioned the universe out of self-existent material, and far from being the Creator of the world, in the strict acceptation of the term, is but its architect and builder.

Both Materialism and Dualism are one in asserting the eternity of matter. Materialism, however, is atheistic, in that it excludes a Creator, while Dualism, although rejecting creation, properly so called, admits the existence of a

Supreme Being. But God, according to dualists, is little more than a demiurge. He is powerful, but not omnipotent. The eternal, self-existent matter which is postulated, and which exists outside of God, rebels against His action, and becomes a cosmic power against which He is powerless.

Pantheism.

Pantheism is the opposite of Materialism. According to the latter, as we have seen, everything is matter; according to the former, as the word indicates, everything is God. The finite and the infinite; the contingent and the necessary; beings, which appear in time, and God, Who is from eternity, are, according to the teachings of pantheists, but different aspects of the same existence. Whether we consider the emanation of the Brahmans, the Pantheism of the Eleatics, or that of the neo-Platonists of Alexandria, or that of Spinoza, Fichte, Schelling and Hegel, the doctrines so taught issue in the negation of creation as well as in the negation of the true nature of God. For to predicate, in

what manner soever, an identity of God with the world, or to conceive God as the material principle, or the primal matter, from which everything emanates, as pantheists do, is to negative completely not only the Christian idea of God, a Being eternal, spiritual in substance, and distinct from the world in reality and essence, but also the Christian and the only true idea of creation.

Having briefly adverted to some of the principal philosophical doctrines which exclude creation in the Christian and Scriptural sense, and having given a hasty glance at some of the more widely-spread errors respecting the nature of the Creator and His creatures, we are now prepared to consider the teachings of Catholic philosophy and theology as to creation, and as to the origin and nature of the material universe.

Dogma of Creation.

Creation, in its strictest sense, is the production, by God, of something from nothing. The universe and all it contains was called into existence *ex nihilo*,

by an act of the Creator, which was not only supernatural, but also absolute and free. It was, therefore, in no wise formed from preëxisting material, for none existed, nor by any emanation from the Divine substance. God alone is necessary and eternal; the world of matter and the world of spirit, outside of God, are contingent, and have their existence in time. But, notwithstanding that the nature of the world of created things is finite, and entirely different from the Divine nature, which alone is infinite and necessary, nevertheless, all the creatures of God have a real existence, although limited in its duration and dependent entirely on Divine Providence for its continuance.

A secondary meaning of the word "creation," is the formation, by God, of something from preëxisting material. This is the natural action of God in the ordaining or administering of the world, as distinguished from the supernatural act of absolute creation from nothing. In this sense God is said to create derivatively, or by the agency of secondary causes. He creates potentially;

that is, He gives to matter the power of producing or evolving, under suitable conditions, all the manifold forms it may ever assume. In the beginning He created matter directly and absolutely, once for all; but to the matter thus created He added certain natural forces—what St. Augustine calls *rationes seminales*—and put it under the action of certain laws, which we call “the laws of nature.” Through the operation of these laws, and in virtue of the powers conferred on matter in the beginning, God produces indirectly, derivatively, by the operation of secondary causes, all the various forms which matter may subsequently assume, and all the divers phenomena of the physical universe.

In another sense, also, the word “creation” may be employed, as when we speak of the creations of genius, or refer to creations of Raphael, Michael Angelo, or Brunelleschi. In these cases, the work of the artist or of the architect consists simply in making use of the laws, and powers and materials of nature, in such wise as to effect a change in form or condition. The action of the

intelligent agents in this case being natural, but more than physical, may conveniently be designated as hyper-physical.

With hyperphysical creation we shall have little to do. Our chief concern will be with absolute, or direct creation, and with secondary or derivative creation, both of which are so often misunderstood and confounded, if not positively denied. It would, indeed, seem that the sole aim and purpose of a certain school of modern scientists, is to discover some means of evading the mystery of creation. For they not only deny creation, but also deny its possibility, and all this because, they with "the fool," persist in saying in their hearts "There is no God." So great, indeed, is their hatred of the words "Creator" and "creation," that they would, if possible, obliterate them from the dictionary, and consign all works containing them to eternal oblivion.

The Vatican Council on Creation.

For a clear and succinct statement of Catholic doctrine, in respect of God as

Creator of all things, as well as for an expression of the Church regarding the errors of Materialism and Pantheism now so rife, we can have nothing better or more pertinent to our present subject than the constitution and canons of the Vatican Council: "*De Deo, Rerum Omnium Creatore.*"

The "*Dogmatic Constitution of the Catholic Faith,*" in reference to "*God, the Creator of all things,*" reads as follows:

"The Holy Catholic Apostolic Roman Church believes and confesses, that there is one true and living God, Creator and Lord of heaven and earth, Almighty, Eternal, Immense, Incomprehensible, Infinite in intelligence, in will, and in all perfection, who as being one, sole, absolutely simple and immutable spiritual substance, is to be declared as really and essentially distinct from the world, of supreme beatitude in and from Himself, and ineffably exalted above all things which exist, or are conceivable, except Himself.

"This one only true God, of His own goodness and Almighty power, not for the increase or acquirement of His own happiness, but to manifest His perfection by the blessings which He bestows

on creatures, and with absolute freedom of counsel, created out of nothing, from the very beginning of time, both the spiritual and the corporeal creature, to wit, the angelical and the mundane, and afterward the human nature, as partaking in a sense of both, consisting of spirit and body."

But the canons of the Council relating to God as Creator of all things, are, if anything, stronger and more explicit than what precedes.

They are as follows :

"1. If anyone shall deny one true God, Creator and Lord of things visible and invisible ; let him be anathema.

"2. If anyone shall not be ashamed to affirm that, except matter, nothing exists ; let him be anathema.

"3. If anyone shall say that the substance and essence of God and of all things is one and the same ; let him be anathema.

"4. If anyone shall say that infinite things, both corporeal and spiritual, or at least spiritual, have emanated from the Divine substance ; or that the Divine Essence by the manifestation and evolution of Itself becomes all things ; or lastly, that God is universal or indefinite being, which by determining itself constitutes the universality of things, distinct ac-

ording to genera, species and individuals ; let him be anathema.

“5. If anyone confess not that the world and all things which are contained in it, both spiritual and material, have been, in their whole substance, produced by God out of nothing ; or shall say that God created, not by His will free from all necessity, but by a necessity equal to the necessity whereby He loves Himself ; or shall deny that the world was made for the glory of God ; let him be anathema.”

We have here in a nutshell the Catholic doctrine of creation, as well as an authoritative pronouncement, which cannot be mistaken, respecting the attitude of the Church towards the Atheism, Materialism and Pantheism which have infected so many minds in our time, and exerted such a blighting influence on contemporary science.

Meaning of the Word “Nature.”

Knowing, now, in what sense we may interpret the word “creation,” in what sense it must be understood according to Catholic teaching, we next proceed to the discussion of the word “nature,” about which so much crass ignorance

prevails, even among those who employ it most frequently, and whom it behooves to have clear ideas as to its import.

“Nature” is frequently employed to designate “the material and spiritual universe as distinguished from the Creator;” to indicate the “world of substance whose laws are cause and effect;” or to signalize “the aggregate of the powers and properties of all things.” It is used to signify “the forces or processes of the material world, conceived as an agency intermediate between the Creator and the world, producing all organisms, and preserving the regular order of things.” In this sense it is often personified and made to embody the old gnostic notion of a demiurge, or an archon; a subordinate, creative deity who evolved from chaos the corporeal and animated world, but was inferior to the infinite God, the Creator of the world of spirits. It is made to refer to the “original, wild, undomesticated condition of an animal or a plant,” or to “the primitive condition of man antecedent to institutions,

especially to political institutions," as when for instance, we speak of animals, and plants being found, or men living in a state of nature. It likewise distinguishes that which is conformed to truth and reality "from that which is forced, artificial, conventional, or remote from actual experience."

These are only a few of the many meanings of the word "nature," and yet they are quite sufficient to show us how important it is that we should always be on our guard lest the term, so often ambiguous and so easily misapplied, lead us into grave mistakes, if not dangerous errors. In works on natural and physical science, where the word "nature" is of such frequent occurrence, and where it possesses such diverse meanings, having often different significations in a single paragraph, there is a special danger of misconception. Here, unless particular attention be given to the changed meanings of the term, it becomes a cloak for the most specious fallacies, and a prolific source of the most extravagant paralogisms.

Any one of the diverse meanings of the word "nature," as just given, is liable to be misconstrued by the unwary. But the chief source of mischief with incautious readers arises from the habit scientific writers have, of indiscriminately personifying nature on all occasions; of speaking of it as if it were a single and distinct entity, producing all the various phenomena of the visible universe, and of referring to it as one of the causes that "fabricate this corporeal and sensible world;" as a kind of an independent deity "which, being full of reasons and powers, orders and presides over all mundane affairs."

When poets personify nature there is no danger of misconception. In their case the figurative use of the term is allowed and expected. Thus, when Bryant tells us that nature speaks "a various language," or when he bids us—

"Go forth under the open sky, and list
To nature's teachings;"

or when Longfellow declares that—

"No tears
Dim the sweet look that nature wears,"

we understand at once that "nature" is but a poetical fiction; and that the term

is to be interpreted in a metaphorical and not in a literal sense.

With naturalists, however, and philosophers, who are supposed to employ a more exact terminology, such a figurative use of language cannot fail, with the generality of readers, to be both misleading and mischievous.

Darwin, and writers of his school, are continually telling us of the useful variety of animals and plants given to man "by the hand of *nature*," and recounting how "*nature* selects only for the good of the being which she tends," how "every selected character is fully exercised by her," and how "natural selection entails divergence of character and extinction of less improved forms." Huxley loves to dilate on how "*nature* supplied the club-mosses which made coal," how she invests carbonic acid, water, and ammonia "in new forms of life, feeding with them the plants that now live." He assures us that "thrifty *nature*, surely no prodigal! but the most notable of housekeepers," is "never in a hurry, and seems to have had always

before her eyes the adage, 'Keep a thing long enough, and you will find a use for it;' " that "it was only the other day, so to speak, that she turned a new creature out of her workshop, who, by degrees, acquired sufficient wits to make a fire."

Nature and God.

Now, there is no doubt but that all these quotations can be understood in an orthodox sense, but the fact, nevertheless, remains, that they are not always so construed, and for the simple reason that both the writers from whom these citations are made, are avowed agnostics. So far as Huxley and Darwin are concerned, there *may* be a personal God, the Creator of the universe; but, they will have it, there is no evidence of the existence of such a Being. On the contrary, according to their theory, there is nothing but matter and motion, and if they do not, like King Lear, say: "Thou, nature, art my goddess," their teachings tend to incline others to the belief that there does really exist an entity subordinate to God, if not inde-

pendent of Him, that produces all existing phenomena, not only in the world of matter, but also in the world of spirit.

It is, then, against this constant misuse of the word "nature," and especially against the many false theories which are based on the misapprehension of its true significance, that it behooves us to be constantly on our guard. Errors of the most dangerous character creep in under the cover of ambiguous phraseology, and the poison of false doctrine is unconsciously imbibed, even by the most cautious. We may, if we will, personify nature, but, if we do so, let it not be forgotten that nature, with all her powers and processes, is but a creature of Omnipotence; that far from being merely an inward, self-organizing, plastic life in matter, independent of God, as was asserted by the hylozoist, Strato of Lampsacus, nature, as good old Chaucer phrases it, is but "the vicar of the Almighty Lord."

Having explained the meaning of the words "creation" and "nature," we are now prepared to consider the subject of Evolution in relation to the teachings of

faith. Here, however, we must again distinguish and explain. There are evolutionists, and evolutionists. There are evolutionists who give us in a new guise the old errors of Atheism, Materialism, and Pantheism; there are others who assert that our knowledge is confined to the phenomenal world, and that, consequently, we can know nothing about the absolute and the unconditioned; and there are others still, who contend that Evolution is not inconsistent with Theism, and maintain that we can hold all the cardinal principles of Evolution without sacrificing a single jot or tittle of Dogma or revelation.

For the sake of simplicity, we shall designate these three classes of evolutionists as: 1, monists; 2, agnostics; and 3, theists. Their doctrines are clearly differentiated, and naturally distinguish three schools of contemporary thought, known respectively as: 1, Monism; 2, Agnosticism; and 3, Theism. This is the most convenient and comprehensive grouping we can give, of the tenets of the leading representatives of modern science and philosophy, and, at the same

time, the most logical and satisfactory. In order to secure as great exactness, and make my exposition as concrete and tangible as possible, I shall, when feasible, allow the chief exponents of Monism, Agnosticism, and Theism, to speak for themselves, and to present their views in their own words. This will insure not only greater accuracy, but will also be fairer, and more in keeping with the plan I have followed in the preceding pages.

CHAPTER III.

MONISM AND EVOLUTION.

Hæckel and Monism.

HISTORICALLY considered, Monism, as a system of philosophy, is as old as speculative thought. It has, however, had various and even contradictory meanings. Etymologically, it indicates a system of thought, which refers all phenomena of the spiritual and physical worlds to a single principle. We have, accordingly, idealistic Monism, which makes matter and all its phenomena but modifications of mind; materialistic Monism, which resolves everything into matter; and, finally, the system of those who conceive of a substance that is neither mind nor matter, but is the underlying principle or substantial ground of both. In each and all of its forms, Monism is opposed to the philosophical Dualism which recognizes two principles—matter and spirit.

The Monism, however, with which we have to deal here, is not the idealism of Spinoza, Berkeley, Hume, Hegel or Schopenhauer, nor the atheistic Materialism of D'Holbach and La Mettrie, which was but a modified form of Epicureanism, but rather a later development of these errors. An outgrowth of recent speculations in the natural and physical sciences, its origin is to be traced to certain hypotheses connected with some of the manifold modern theories of Evolution.

The universally-acknowledged protagonist of contemporary Monism is Ernst Hæckel, professor of biology in the University of Jena. He is often called "the German Darwin," and is regarded, with Darwin and Wallace, as one of the founders of the theory of organic Evolution. From the first appearance of Darwin's "Origin of Species," he has been a strong and persistent advocate of the development theory, and did more than anyone else to popularize it in Germany and throughout the continent of Europe. He has, however, gone much further

than the English naturalist, in his inductions from the premises supplied by the originator of the theory of natural selection. He draws conclusions from Darwinism at which many of its advocates stand aghast, and which, if carried out in practice, would not only subvert religion and morality, but would sap the very foundations of civilized society. Anti-monists, of course, contend that Hæckel's conclusions are not valid, and that there is nothing either in Darwinism, or Evolution, when properly understood, which warrants the dread inductions which have been drawn from them by the Jena naturalist.

To understand the nature of Hæckel's doctrines, and to appreciate the secret of his influence, we must consider him in a three-fold capacity—as a scientist, as a philosopher, and as the hierophant of a new form of religion, “the religion of the future.”

Hæckel as a Scientist.

As a scientist, especially as a biologist, he deservedly occupies a high

place. Of unquestioned ability, of untiring industry, and of remarkable talent for original research, he is distinguished also for a certain intrepidity and assertiveness in promulgating his views, which have given him, not only a reputation, but a notoriety which is world-wide. His best work, probably, has been done in connection with his investigations of some of the lower forms of life, especially the protista, the radiolaria, and the calcareous sponges. His researches in this direction would alone have been sufficient to make him famous in the world of science. But concerning these researches the general public knows little or nothing. The works of Hæckel which have made his name familiar the world over, are his popular expositions of evolutionary doctrines, viz., his "*Natürliche Schöpfungsgeschichte*," or "*Natural History of Creation*," and "*Anthropogenie*," or "*Evolution of Man*." In these works, his chief endeavor is to present the theory of Evolution in a popular form, and to give the evidences on which it is founded.

Hæckel's Nature Philosophy.

But he does more than this. Not satisfied with being an expounder of the truths of science, he promulgates views on philosophy and religion which are as radical as they are irrational. He appears not only as a professor of biology, but poses as the founder of a new school of philosophy, and as the high-priest of a new system of religion. He commits the error into which so many have fallen, of confounding the methods of metaphysics with those of experimental science, and of mistaking *a priori* reasoning for strict inductive proof.

The name which Hæckel gives his nature-philosophy, as he loves to call it, is, as already stated, Monism. The word "Monism" is often attributed to the Jena professor, but erroneously, as it was coined by Wolf long before. Hæckel has, however, given it a new meaning, and the one which is now generally understood when Monism is in question. He has, as he tells us, chosen this term so as to eliminate the errors attaching to Theism, Spiritualism, and Materialism, as well as to the

Positivism of Comte, the Synthetism of Spencer, the Cosmism of Fiske, and other like evolutionary systems of philosophy. But here I shall let Hæckel speak for himself.

In his "Evolution of Man," he declares:

"This mechanical or monistic philosophy asserts that everywhere the phenomena of human life, as well as those of external nature, are under the control of fixed and unalterable laws; that there is everywhere a necessary causal connection between phenomena, and that, accordingly, the whole knowable universe forms one undivided whole, a 'monon.' It further asserts that all phenomena are produced by mechanical causes, *causæ efficientes*, not by prearranged, purposive causes, *causæ finales*. Hence, there is no such thing as 'free-will' in the usual sense. On the contrary, in the light of this monistic conception of nature, even those phenomena which we have been accustomed to regard as most free and independent, the expressions of the human will, appear as subject to fixed laws as any other natural phenomenon. Indeed, each unprejudiced and searching test applied to the action of our free will, shows that the latter is never really free, but is always determined by previous

causal conditions, which are eventually referable either to heredity or to adaptation. Accordingly, we cannot assent to the popular distinction between nature and spirit. Spirit exists everywhere in nature, and we know of no spirit outside of nature."

Elsewhere, he tells us :

"Unitary philosophy, or Monism, is neither extremely materialistic, nor extremely spiritualistic, but resembles rather a union and combination of these opposed principles, in that it conceives all nature as one whole, and nowhere recognizes any but mechanical causes. Binary philosophy, on the other hand, or Dualism, regards nature and spirit, matter and force, inorganic and organic nature, as distinct and independent existences."

Again, he assures us regarding the theory of development of Darwin that :

"If carried out logically, it must lead us to the monistic, or mechanical, causal conception of the universe. In opposition to the dualistic, or teleological conception of nature, our theory considers organic as well as inorganic bodies, to be the necessary products of natural forces. It does not see in every species of animal and plant the embodied thought of a personal Creator, but the expression,

for the time being, of a necessarily active cause, that is, of a mechanical cause, *causa efficiens*. Where teleological Dualism seeks the thoughts of a capricious Creator in the miracles of creation, causal Monism finds in the process of development the necessary effects of eternal, immutable laws of nature."

Five Propositions of Hæckel.

These quotations would seem to be sufficiently explicit, but Hæckel, not satisfied with such general statements, has been pleased to lay down five theses, respecting the theory of Evolution, which admit neither doubt nor ambiguity. They are worded as follows:

1. "The general doctrine [of Evolution] appears to be already unassailably founded.

2. "Thereby every supernatural creation is completely excluded.

3. "Transformism and the theory of descent are inseparable constituent parts of the doctrine of Evolution.

4. "The necessary consequence of this last conclusion is the descent of man from a series of vertebrates.

5. "The belief in on 'immortal soul,' and in 'a personal God' are therewith—

i. e., with the four preceding statements—completely ununitable [*völlig unvereinbar*].”

Such, then, in brief compass, is Monism as expounded by its latest and most applauded doctor and prophet. Such is Hæckelism, about which so much is said, but concerning which there is so little accurate knowledge. As is manifest from the above five propositions, it is but a neologistic formulation of old errors; a recrudescence, in modern scientific terminology, of the teachings of the Ionian and Greek materialistic schools; a rechauffé of the well-known atomic theory of Leucippus and Democritus of Abdera; a *mixtum compositum* of science, philosophy and theology; an *olla podrida* compounded of the most glaring errors and absurdities of Atheism, Materialism and Pantheism, ancient and modern.

God and the Soul.

God, according to Hæckel, is but a useless hypothesis. A personal “Creator is only an idealized organism, endowed with human attributes; a gross anthropomorphic conception, corresponding

with a low animal stage of development of the human organism." Hæckel's idea of God, an idea which, he assures us, "belongs to the future," is the idea which was expressed by Giordano Bruno when he asserted that: "A spirit exists in all things, and no body is so small but contains a part of the Divine substance within itself, by which it is animated." In the words of one of Hæckel's school, the true God is the totality of the correlated universe, the Divine reality, and there is, therefore, "no possible room for an extramundane God, a ghost, or a spook, anyway or anywhere."

The atom, eternal and uncreated, is the sole God of the monist. Hæckel's atom, however, is not the atom of the chemist—an infinitesimally small particle of inorganic matter, the smallest constituent part of a molecule. It is far more. It is a living thing, endowed not only with life but also possessed of a soul. And this is no mere hypothesis with him. It is, he will have it, a demonstrated doctrine, an established fact. "An atom soul," "a molecule

soul," "a carbon soul," are among the first corollaries of Monism, which, one of its advocates tells us, is now "irrefragable, invincible, inexpugnable."

Organic and Inorganic Matter.

There is, in Hæckel's estimation, no essential difference between inorganic and organic matter ; no impassable chasm between brute and animated substance. All vital phenomena, especially the fundamental phenomena of nutrition and propagation, are but physico-chemical processes, identical in kind with, although differing in degree from, those which obtain in the formation of crystals and ordinary chemical compounds. Like D'Holbach, he identifies mental operations with physical movements ; and, like Robinet, he attributes the moral sense to the action of special nerve-fibres. His *Weltseele* is not like that of Schelling, a spiritual principle or intelligence, but a blind unconscious force which always accompanies, and is inseparably connected with, matter.

According to his views, sensation is a product of matter in movement, and

consciousness is but a summation of the rudimentary feeling of ultimate sentient atoms. The genesis of mind is thus entirely a mechanical process, and the conceptions of genius are but the result of the clash of atoms and the impact of molecules. Intellectual work is the correlative of certain brain-waves; thrills of gratitude, and love of friends and country, are mere oscillations of infinitesimal particles of brute matter. Pleasure and pain, joy and sorrow, are the direct product of vibratory motion, and the difference in the nature of these emotions arises solely from the difference in the character of the generating shakes and quivers. Like Cabanis, Hæckel makes thought a secretion of the brain, and holds, with Vogt, that the brain secretes thought as the liver secretes bile. With Moleschott, he would assert that thought is dependent on phosphorus, and with Büchner he would declare it to be a product of nervous electricity. In the words of Caro, he teaches that: "In matter, resides the principle of movement; in movement, is the reason of life; in life, is the reason of

thought." Hence, in returning to the first term of the series, we observe that thought and life are only forms of movement, which is the original inherent property of eternal matter.

With Hugo, Hæckel would exclaim:

"Learn that everything knows its law, its end
its way; . . .
That everything in creation has consciousness.
. Winds, waves, flames,
Trees, reeds, rocks, all are alive! All have
souls . . .
Compassionate the prisoner, but compassionate
the bolt;
Compassionate the chain, in dark, unhealthy
prisons;
The axe and the block are two doleful beings,
The axe suffers as much as the body, the block
as much as the head."

The Religion of the Future.

Such, in brief outline, are the leading conclusions of Hæckel's teachings in science and philosophy. What, now, are his views on religion? For his friends and disciples assert that he is not only a great scientist, and a great philosopher, but that he is also to be saluted as the prophet and high-priest of the religion of science, which means, we are assured, the religion of the future. According to a recent exponent of Hæckelism:

“We find the religious history of our race to consist of a gradual Evolution of its leading peoples from a broad base of general Animism and Fetichism, thence to astrology, thence to Polytheism, thence to Monotheism, and thence to Scientism, expressed chiefly to us in the Pantheism of Goethe, the Positivism of Comte, the Synthetism of Spencer, the Cosmism of Fiske, and finally by the Monism of Hæckel.”

His new form of religion, we are told, “rises above all religions as the culmination of all. If anything can be, it is, the universal faith,” and this because “it is based upon verified science.”

Truth to tell, however, Hæckel’s own views concerning religion are as crude and as extravagant as many of his expressed opinions respecting philosophy and science. The monistic religion of nature, he informs us, “we should regard as the veritable religion of the future.”

“It is not,” he continues, “as are all the religions of the churches, in contradiction, but in harmony with a rational knowledge of nature. While the latter have no other source than illusions and superstitions, the former reposes on truth and science. Simple, natural religion, based on a perfect knowledge of nature

and its inexhaustible treasure of revelations, will, in the future, impress on Evolution a seal of nobility, which the religious dogmas of divers people have been incapable of giving it. For these dogmas rest on a blind faith in obscure mysteries, and in mythical revelations formulated by priestly castes. Our epoch, which shall have had the glory of achieving the most brilliant result of human research, the doctrine of Evolution, will be celebrated in coming ages as having inaugurated a new and fecund era for the progress of humanity; an era characterized by the triumph of freedom of investigation over the domination of authority, through the noble and puissant influence of monistic philosophy."

This brief extract from Hæckel's inept statements about religion, concerning which, it is manifest, he is crassly ignorant, will relieve us from the necessity of following further this trumpeted reformer of religion and omniscient seer of Monism. It would be difficult to collect together, in the same space, a greater number of misstatements of fact, more glaring absurdities, or more preposterous propositions, than those contained in the foregoing quotation

from one of his best-known and most popular works. I shall not attempt categorically to refute his errors of history and philosophy, of science and theology, as this is beyond the scope of the present work. Neither shall I waste time in indicating wherein he has put himself, especially in matters of theology and religion, against the unanimous teaching of the saints and sages of all time. A mere presentation of his errors, in a clear light and in bold relief, is a sufficient, if not the best refutation for all reasonable men. Hæckel's vagaries but emphasize once more a fact which has often been signalized—the danger incurred by specialists, particularly by mere physicists and biologists, when they attempt to discuss matters of which they are not only ignorant, but which are entirely foreign to their ordinary trend of thought, and when they pass the frontiers with which they may be familiar, and, entering upon a domain of knowledge with which they are entirely unacquainted, seek the discussion of topics for which both their temper and education totally disqualify them.

Such a congeries of errors, scientific, philosophic and theologic, error personified, as it were, as that which we have just been contemplating, forcibly reminds one of the words of the Mantuan bard when he describes the giant Polyphemus, whose solitary orb was burnt out by Ulysses,

“*Monstrum horrendum, informe, ingens, cui lumen ademptum.*”¹

But if Hæckel is the accomplished biologist he is reputed to be, if he is one of the leading representatives of contemporary science, and even his enemies will not deny that he is all this, how comes it, it will be asked, that he has fallen into so many errors and that he has so many enthusiastic followers?

For those who are familiar with the life-work of the Jena professor, and know how bindly the multitude follow one who is looked upon as an authority in science, how prone they are to hero worship, there will be no difficulty in answering those questions and in reconciling what are, at least, apparent contradictions.

¹ “A frightful, misshapen, huge monster deprived of sight.”

Hæckel's Limitations.

Hæckel, no one questions it, has achieved deserved eminence in his chosen field of work. But Hæckel is a specialist, an ardent specialist, and his limitations are very strongly marked. As a student of the lower forms of life, to which he has devoted the greater portion of his time, he has probably no superior, and but few peers. But the very ardor with which he has cultivated science, and forced everything to corroborate a pet theory, has made him one-sided and circumscribed in his views of the cosmos as a whole, so as practically to incapacitate him for the discussion of general questions of science and philosophy, and much more those of theology. Like all specialists, he suffers from intellectual myopia, and it is almost inevitable that such should be the case. He examines everything as he would a microbe or a speck of protoplasm, under the objective of his microscope. He applies the methods of induction to questions of metaphysics, and confounds the principles of

metaphysics with the data of experimental science. The result, as might be anticipated, is to "make confusion worse confounded." For such a one, the only cure is a broader knowledge and a rigid and systematic drill in the fundamental rules of dialectics. Verily, for a specialist afflicted as Hæckel is, and he is but a type of the majority of specialists, it behooves him to purge—

"With euphrasy and rue
The visual nerve, for he hath much to see."

But is this the sole explanation of the manifold errors into which the German naturalist has lapsed, and will this account for his false declamation against religion, and his vehement denunciation of the Church, and of what she regards as most sacred? It is to be feared not. There is more than simple antipathy in his case. There is downright hatred. Only on this assumption can we explain the use of the violent and blasphemous language which is of such frequent occurrence in his more popular works.

As to the reading public, their position is not difficult to understand. They

are, as it were, hypnotized, by what a German writer, Wiegand, aptly designates "the confused movement of the mind of our age," and are, so far as their ability to think and judge for themselves goes, in a state of chronic catalepsy. They mistake assertions for proof, theories for science, and regard a conglomeration of neologisms, which explain nothing, as so much veritable knowledge.

Verbal Jugglery.

The secret of Hæckel's prestige and influence with his readers, is not due simply to the extent of his information in his special line of study, nor to the astonishing mass and variety of facts which he discusses and compares, but rather to his manner of presenting facts, and to his adroitness in drawing the conclusions which suit him, whether such conclusions are warranted by the facts or not. With Hæckel, especially when treating of his favorite topics, Evolution and Monism, the wish is always father to the thought, and he has a way of convincing his readers that he

is right, even when they have reason to suspect, if they are not certain, that he is positively wrong.

One of the chief reasons for Hæckel's success as a theorist, is to be found in the fact that he is an expert in verbal jugglery, and a consummate master in the art of sophistry. Whether his use of sophism is intentional or not, is not for me to say. It does, however, seem almost incredible, that anyone endowed with ordinary reasoning powers could unconsciously fall into so great, and so frequent, errors of logic, as may be seen on almost every page of Hæckel's evolutionary works. He possesses in an eminent degree, as has been well said of him, what a French prestidigitator declared to be the leading principle of legerdemain, viz., "the art of making things appear and disappear." This is true. What Robert Houdin is among conjurers, that is Hæckel among what the Germans call the "nature-philosophers" of the present generation.

The suppositions which he continually makes, and the postulates which

everywhere abound in his writings, show the looseness of his reasoning and the flimsiness of the structure which he has reared with such a flourish of trumpets, and to which he points with such evident feelings of arrogant exultation. On almost every page of his "Evolution of Man," and his "History of Creation," we find such phrases as "there can be no doubt;" "which may safely be regarded;" "as is now very generally acknowledged;" "we can with more or less certainty recognize;" "it might be argued;" "a conception which seems quite allowable;" "we can, therefore, assume;" "we may assert;" "this justifies the conclusion;" and numberless others of similar import, which, like the paraphernalia of the magician, are designed to perplex and deceive. Attention, however, to the matter under discussion, will always reveal the imposture in Hæckel's case, and disclose the fact that his plausible statements are often nothing more than rhetorical artifices and tricks of dialectics; the reasonings of a special pleader who has before his mind but one aim,

to give *vraisemblance* to an assumption that cannot be substantiated by fact.

Understanding his methods of reasoning, and the reckless manner in which he draws conclusions not contained in the premises, we need not be surprised to have Hæckel tell us, as he does in his fanciful pedigree of man, that we must "regard the *amphioxus* with special veneration, as that animal which alone, of all extant animals, can enable us to form an approximate conception of our earliest Silurian vertebrate ancestors." Neither need we be surprised, because we know the man's flippancy and cynicism, when he declares that "the *amphioxus*, skull-less, brainless and memberless as it is, deserves all respect as being of our own flesh and blood," and that this same brainless creature "has better right to be an object of profoundest admiration and devoutest reverence, than any of that worthless rabble of so-called 'saints,' in whose honor our 'civilized and enlightened' cultured nations erect temples and decree processions."

Type of a Class.

But we need not follow further the Jena professor in his extravagant speculations and his wild diatribes against religion and Christian philosophy. He has already been given more attention than his work deserves. He is, however, a type of a class, and of quite a large class of scientific men who hold similar views, and who reason in a similar manner. The saying, *ab uno disce omnes*, is specially applicable here, because to know one, and, especially, to know the leader, is to know all. The methods of all those belonging to the school of which Hæckel is such an outspoken exponent are identical. They are all experts in the "art of making things appear and disappear," and if not as adroit as their master in the use of sophism, they are nevertheless, able to deceive the unwary and thus accomplish untold mischief.

Considering the nature of the teachings of Monism, it is not surprising that Hæckel and his school should have such a multitude of adherents and

sympathizers as they are known to have.

“In the troublous times in which we live,” observes the distinguished savant, the Marquis de Nadaillac, “and in the midst of the confusion of ideas of which we are the sorrowful witnesses, human pride has attained proportions hitherto unknown. Science has become more dogmatic and more imperious than was ever theology. It counts, by thousands, adepts who speak with emphasis of modern science, without very often knowing the first word about it. But I am mistaken—they have been taught that modern science is the negation of creation, the negation of the Creator. God belongs to the old régime; the idea of his justice weighs heavily on our enervated consciences. Accordingly, when a hypothesis, or a discovery, seems to contravene Christian beliefs, it is accepted without reflection and promulgated with inexplicable confidence. It is in this fact, rather than in its scientific value, that we must seek the *raison d’être* of transformation.”

But probably no better explanation could be given of the confusion and perplexity which now reign supreme, especially among the masses, in matters

of science, philosophy and theology, than is expressed by the old Epicurean poet when he affirms:

“Omnia enim stolidi magis admirantur
 amantque,
Inversis quæ sub verbis latitantia cernunt;
Veraque constituunt, quæ belle tangere possunt
Aureis, et lepidò quæ sunt fucata sonore.”¹

¹ “For fools rather admire and delight in all things which they see hid under inversions and intricacies of words, and consider those assertions to be truths which have power to touch the ear agreeably, and which are disguised with pleasantness of sound.” Lucretius, “*De Rerum Natura*,” Lib. I, 642-45.

CHAPTER IV.

AGNOSTICISM AND EVOLUTION.

Nature and Scope of Agnosticism.

A MORE popular form of error than Monism, or scientific Atheism, and one which is more wide-spread and devastating in its effects, is the new-fangled system, if system it can be called, known as Agnosticism. To the superficial student it is not without color of plausibility, and by concealing the objectionable and repulsive features of Monism, it now counts more adherents, probably, than any other form of scientific error.

Like Monism, Agnosticism is a system of thought which has allied itself with the theory of Evolution, from which, as ordinarily understood, it is inseparable. Like Monism, it is a *mixtum compositum*

of science, philosophy and theology, in which science and Evolution are predominant factors. And, like Monism, too, it is a new name for an old form of error. Unlike Monism, however, Agnosticism affects to suspend judgment, where Monism makes a positive assertion, or enters a point-blank denial. In many questions of fundamental importance, Agnosticism is ostensibly nothing more than simple doubt, or gentle skepticism, while Monism is always arrogant, downright affirmation, or negation. In its ultimate analysis, however, Agnosticism as well as Monism issues in a practical denial of a personal God, the Creator of the universe, and relegates Providence, the immortality of the soul, and the moral responsibility of man to a Divine Being, to the region of fiction.

Again, Agnosticism, like Monism, is peculiarly and essentially the product of a combination and a succession of causes and conditions. As no one individual can be pointed to as the father of Monism, so no one person can be singled out as the founder of Agnosti-

cism. Both may have, and have had, their recognized exponents; both like a Greek drama, have their choragi and coryphei, but these exponents, these choragi and coryphei, are not spontaneous growths. They do not, Minerva-like, leap suddenly into the intellectual arena, fully developed and armed cap-a-pie. On the contrary, they are the product of their environment, as affected by a series of antecedent factors and influences. They had their predecessors and prototypes, those who planted the seeds which lay dormant until new conditions favored germination and development. Then the fruit contained in the germ was made manifest, and the poison which had been so surreptitiously instilled, was discovered when it was too late to administer an antidote.

The word "agnostic" was invented by the late Prof. Huxley in 1869. He took it from St. Paul's mention, in the Acts of the Apostles, of the altar erected by the Athenians "to the unknown God," ἀγνώστῳ θεῷ, and, to the inventor's great satisfaction, the term took, and

soon found a recognized position in the languages of all civilized nations.

Huxley, however, although the coiner of the word Agnosticism, and one of its most zealous and popular exponents, is not its coryphæus. This position is held by the philosopher of "the unknowable," Herbert Spencer, who has done far more than any other one person to establish what might be called a school of agnostic philosophy. When it is remembered that Spencer is likewise the philosopher of Evolution, "our great philosopher," as Darwin calls him, we can see what an intimate connection there must be between Evolution, as a scientific theory, and Agnosticism as a system of philosophy.

Huxley and Romanes.

Huxley, indeed, has done more, probably, than anyone else to popularize Agnosticism, and by the majority of readers he is regarded as its chief exponent and defender. He, however, disclaims anything like a creed, and declares that agnostics are precluded from having one by the very nature of their mental

status. He prefers to regard Agnosticism, not as a creed, but as "a method, the essence of which lies in the rigorous application of a single principle."

"Positively," he informs us, "the principle may be expressed: In matters of the intellect, follow your reason as far as it will take you, without regard to any other consideration. And negatively: In matters of the intellect do not pretend that conclusions are certain which are not demonstrated or demonstrable. That I take to be the agnostic faith, which, if a man keep whole and undefiled, he shall not be ashamed to look the universe in the face, whatever the future may have in store for him."

The profession of faith of G. J. Romanes, is more explicit, at least in so far as it refers to God, and gives us in a few words the views entertained by the two leading classes of agnostics regarding the First Cause, or the Absolute or Unconditioned.

"By Agnosticism," asserts Romanes, "I understand a theory of things which abstains from either affirming or denying the existence of God. It thus represents with regard to Theism a state of suspended judgment; and all it undertakes

to affirm is, that upon existing evidence the being of God is unknown. But the term Agnosticism is frequently used in a widely different sense, as implying belief that the being of God is not merely now unknown, but must always remain unknown."

Docta Ignorantia.

The agnostic creed, then, is a creed based on ignorance rather than on knowledge. We can know nothing that does not come within the range of sense ; nothing which we cannot observe with our microscopes, spectroscopes and telescopes, or examine with our scalpels, or test in our alembics and crucibles. Our knowledge is and must be, by the very nature of the case, limited to things material and phenomenal. Every attempt to fathom the mysteries of the super-sensible or spiritual world, if there be such a world, or to trace a connection between noumenal cause or phenomenal effect, if there be such a connection, must, we are told, prove useless and abortive. There may or there may not be, a God ; we hope there is a God, but we have no warrant

for asserting His existence. We cannot affirm either that He is personal or impersonal, intelligent or unintelligent; we cannot say whether He is mind or matter. We cannot, by searching, find Him out, and our every assertion regarding Him is but a contradiction in terms. If there be a Supreme Being, a First Cause, an Absolute Existence, an Ultimate Power; if, in a word, there be a God, He not only is now, but ever must be, unknown and unknowable,

“There may be absolute truth, but if there is, it is out of our reach. It is possible that there may be a science of realities, of abstract being, of first principles and *a priori* truths, but it is up in the heavens, far above our heads, and we must be content to grovel amid things of earth—to build up as best we can our fragments of empirical knowledge, leaving all else to that future world, in which, in a clear light, if there is ever to be a clearer light for us, we shall know, if there is such a thing as knowledge, the nature and attributes of God, if there is a God, and if His nature can be known, and if His attributes are anything more than a fiction of theologians.”¹

¹ *The Month*, vol. XLV, p. 156.

The Duke of Argyll in his interesting work, "The Unity of Nature" well observes :

"This fundamental inconsistency in the agnostic philosophy, becomes all the more remarkable when we find, that the very men who tell us that we are not one with anything above us, are the same who insist that we are one with everything beneath us. Whatever there is in us or about us which is purely animal, we may see everywhere ; but whatever there is in us purely intellectual, or moral, we delude ourselves if we think we see it anywhere. There are abundant homologies between our bodies and the bodies of beasts ; but there are no homologies between our minds and any Mind which lives and manifests itself in nature. Our livers and our lungs, our vertebræ and our nervous systems, are identical in origin and in function with those of the living creatures around us ; but there is nothing in nature, or above it, which corresponds to our forethought or design or purpose, to our love of the good, or our admiration of the beautiful, to our indignation with the wicked, or to our pity for the suffering or the fallen. I venture to think that no system of philosophy that has ever been taught on earth, lies under such a weight of antecedent

improbability; and this improbability increases in direct proportion to the success of science in tracing the unity of nature, and in showing step by step how its laws and their results can be brought into more direct relation with the mind and intellect of man."

Agnosticism as a *Via Media*.

Agnosticism professes to be a kind of *via media* between Theism and Atheism. It does not deny the existence of God, but declares that a knowledge of Him is unattainable. Whether he has personality or not; whether He has intelligence or not; whether He is just, holy, omnipotent, omniscient or not; whether He has a care for man and watches over him or not; whether He has created man and the earth he inhabits or not—all these are questions which are simply insoluble; are matters which are, and must forever be, beyond the ken and apprehension of the human intellect.

A very slight examination will suffice to convince anyone that such a *via media* cannot exist; that, notwithstanding what its advocates may assert to the

contrary, Agnosticism is but Atheism in disguise. More than this ; it is worse than Atheism. An atheist, although he may deny the existence of God, is nevertheless open to discuss the subject. An agnostic, however, takes away all matter for discussion by insisting that God, if there be a God, is unknowable, and being so, is beyond and above the reach of reason and consciousness. Far from being the Creator of heaven and earth and all things, as faith teaches, God, according to the agnostic, is but a creature of the imagination, a figment of theologians, and religion, even in its pure and noblest form, is but a development of fetichism or ghost-worship.

Our present concern, however, is not so much with Agnosticism as a system of belief or unbelief, as with Agnosticism in relation to the theory of the origin and Evolution of the visible universe.

Origin of the Universe.

The great and perpetual crux for agnostics, as well as for atheists, is the existence of the world. For the theist,

the origin of the material universe offers no difficulty. He accepts as true the declaration of Genesis, that: "In the beginning God created heaven and earth," and with the acceptance of this truth, all difficulty, based on the fact of creation, vanishes forthwith. But to the agnostic, as well as to the atheist, the query: Whence the world and the myriad forms of life which it contains?—is constantly recurring, and with ever-increasing persistency and importance. It is, as all must acknowledge, a fundamental question, and no system of thought is worthy of the name of philosophy, that is not able to give an answer which the intellect will recognize as rational and conclusive.

According to Herbert Spencer, there are but "three verbally intelligent suppositions," respecting the origin of the universe. "We may," he says, "assert that it is self-existent; or that it is self-created; or that it is created by an external agency. That it should be self-existent is inconceivable, because this" implies the conception, which is an impossibility, of infinite past time. To

this let us add, that even were self-existence conceivable, it would not in any sense be an explanation of the universe, nor make it in any degree more comprehensible. Thus the atheistic theory is not only absolutely unthinkable, but even if it were thinkable, would not be a solution.

“The hypothesis of self-creation,” the English philosopher continues, “which practically amounts to what is called Pantheism, is similarly incapable of being represented in thought. Really to conceive self-creation, is to conceive potential existence passing into actual existence by some inherent necessity; which we cannot do. And even were it true that potential existence is conceivable, we should still be no forwarder. For whence the potential existence? This would just as much require accounting for existence, and just the same difficulties would meet us.”

According to Spencer, therefore, both the pantheistic and the atheistic hypotheses must be dismissed, as utterly inadequate to explain the fact of the world's actual existence.

The third hypothesis, and the one generally received, is known as the the-

istic hypothesis; creation by an external agency. But, still to quote Spencer :

“The idea of a Great Artificer shaping the universe, somewhat after the manner in which a workman shapes a piece of furniture, does not help us to comprehend the real mystery; viz., the origin of the materials of which the universe consists. . . . But even supposing that the genesis of the universe could really be represented in thought as the result of an external agency, the mystery would be as great as ever, for there would still arise the question: How came there to be an external agent, for we have seen that self-existence is rigorously inconceivable? Thus, impossible as it is to think of the actual universe as self-existing, we do but multiply impossibilities of thought by every attempt we make to explain its existence.”

According to Spencer, then, the theistic hypothesis of creation is as unthinkable as the hypotheses of Atheism and Pantheism. The theistic, as well as the atheistic and the pantheistic views, he will have it, imply a contradiction in terms, and, such being the case, we must, perforce, resign ourselves to the acceptance of the agnostic position, which is one of ignorance and darkness.

Spencer's Unknowable.

But, strive as he may, Spencer cannot think of the world around him without thinking of it as caused—and hence he is forced to think of a First Cause, infinite, absolute and unconditioned. And in spite of his assertion that God is and must be unknowable, he is continually contradicting himself by assigning characteristics and attributes to that of which he avers we can know absolutely nothing. For He, of whom nothing can be known, of whom nothing can be declared, is, Spencer affirms, the First Cause of all, the Ultimate Reality, the Inscrutable Power, that which underlies all phenomena, that which accounts for all phenomena, that which transcends all phenomena, the Supreme Being, the Infinite, the Absolute, the All-Being, the Creative Power, the Infinite and Eternal Energy, by which all things are created and sustained; a mode of being as much transcending intelligence and will as these transcend mechanical motion.

Sources of Agnosticism.

One of the chief sources of the Agnosticism now so rampant, is to be

sought in the lamentable ignorance of the fundamental principles of true philosophy and theology everywhere manifest, and especially in the productions of our modern scientists and philosophers. And the only antidote for agnostic, as well as atheistic teaching, is that scholastic philosophy which contemporary thinkers ignore, if they do not positively condemn; for it alone can clear up the fallacies which are constantly admitted in the name of philosophy, and which have done so much to confuse thought and to make sound ratiocination impossible.

Another not unfrequent cause of error arises from a false psychology, from confounding or identifying a faculty—imagination—which is material, with a faculty—reason—which is immaterial. Mind is made a function of matter, and that which cannot be pictured to the imagination is regarded as impossible of apprehension by the intellect. That, therefore, which the imagination cannot admit, cannot be accepted by reason; that which is unimaginable is, *ipso facto*, unthinkable. Such is the suicidal

skepticism of those who confuse the immaterial thought, which is above and beyond sense, with the material imagination, which is always intimately connected with sense, and which, by its very nature, is incompetent to rise above the conditions and limitations of matter.

Again, probably no two terms are more prolific of fallacy and confusion than the much-abused words time and space.

Infinite Time.

One of the gravest objections against the existence of God, from Spencer's point of view, is that we cannot conceive of a self-existent being, because self-existence implies infinite past time, which is a contradiction in terms. We cannot conceive of God existing from all eternity, because eternity is but time multiplied to infinity, and we cannot conceive time multiplied to infinity.

The difficulty here indicated arises from a misapprehension of the nature of time, and from an anthropomorphic view of God, which subjects Him to the conditions and limitations of His creatures.

God has not existed through infinite time, as is supposed. He does not exist in time at all. He exists apart from time; and before time was, God was. Time implies change and succession; but in God there is neither change nor succession. As the measure of the existence of created things, it is something relative; but in God all is absolute. Eternity is not, as the agnostic has it, time raised to an infinite power, no more than the attributes of God are human attributes raised to an infinite power. God has existed from all eternity, but He is, by His very nature, above time, and before time, and beyond time, even infinite time. To make God exist through infinite past time, because He has existed from all eternity, would be tantamount to imposing on Him the conditions of created things, and to degrading Him as much as do the most extravagant of anthropomorphists.

Infinite Space.

And as God does not exist in time, so He does not exist in space. Infinite space, like infinite time, is a contradiction in terms. If there were nothing to

be measured, if material objects could be annihilated, space would disappear. For space is not an independent entity, as agnostics suppose, not a kind of a huge box, which was created for the reception of material things, but the necessary and concomitant result of the creation of matter, of what is limited and capable of measurement. And as God is above and before and beyond time, so is He likewise above and before and beyond space. As time began only when God uttered His creative *fiat*, so space had no existence until the creation of the material universe. Neither space nor time, therefore, can be used as a foundation on which to base an argument against creation, or the existence of a First Cause, for both space and time imply limitation, and God, the Absolute, is above and independent of all limitation. Agnostics, who protest so strongly against Anthropomorphism, are, therefore, themselves anthropomorphists, when they attempt, as they do by their irrational theory, to tie down the Creator to the conditions of His creatures.

Mysteries of Nature.

I have said that one of the chief causes of Agnosticism is ignorance of Christian philosophy and theology. This is true. But there is also another reason. The mysteries of nature which everywhere confront us, and which baffle all attempts at their solution; the impossibility of lifting the veil which separates the visible from the invisible world, are other sources of skepticism, and contribute not a little to make Agnosticism plausible, and to give it the vogue which it now enjoys.

“Hardly,” says the Wise Man, “do we guess aright at things that are upon earth; and with labor do we find the things that are before us. But the things that are in Heaven, who shall search out?”

The mysteries of the natural order, those which confront us on the threshold of the unseen, are great and often insoluble; but how much greater, how much more unfathomable, are those that envelop the world beyond the realm of sense, the world of spirit and soul, the

world of angelic and Divine intelligence!

The difficulties indicated are grave indeed, but skeptics are not the only ones who have given them thought or fully appreciated their magnitude. There is a Christian as well as a skeptical Agnosticism, and all the difficulties suggested by the mysteries of the natural and supernatural orders, were long ago realized and taken into account by Christian philosophy and Christian theology. They were before the minds of Origen and Clement of Alexandria; they occupied the brilliant intellects of St. Basil, St. John Chrysostom, St. Gregory of Nyssa and St. Augustine; they entered into the disputations of the Schoolmen, and have found a prominent place in the writings of their successors up to the present day. No, these difficulties have not been ignored; neither have they been underrated nor dismissed without receiving the consideration their importance demands. Far from being new, as certain writers would have us believe; far from being the product of

the research of these latter days; far from being the result of those deep and critical investigations which have been conducted in every department of knowledge, sacred and profane, they are as old as the Church, as old even as speculative thought.

Christian Agnosticism.

Unlike the Agnosticism of skepticism, however, Christian Agnosticism is on firm ground, and, guided by the principles of a sound philosophy, is able with unerring judgment to discriminate the true from the false, and to draw the line of demarcation between the knowable and the unknowable. Christian Agnosticism confesses aloud that God is incomprehensible, that we can have no adequate idea of His perfections, but, unlike skeptical Agnosticism, it brushes aside the false and delusive hope, that in the distant future, when our faculties are more highly developed, when the work of Evolution is farther advanced than it now is, we may perhaps be able to comprehend the Divine nature, and have an adequate notion of the Divine

perfections. Christian Agnosticism tells us that not even the blessed in Heaven, who see the whole of the Divine nature, can ever have, even after millions and billions of ages, a knowledge which shall be commensurate in depth with the Divine Object of their adoration and love. They shall see God in the clear light of the Beatific Vision, *facie ad faciem*, and shall know as they are known. Nothing shall be hidden from them. Their intelligence will be illumined by the light of God's glory. The veil that now intervenes between the Creator and the creature will be removed, and the created intellect will be in the veritable presence of the Divine Essence. But even then, it will be impossible to have an adequate or a comprehensive knowledge of God. He will, as the Scholastics phrase it, be known *totus sed non totaliter*. The soul will always have new beauties undiscovered, fresh glories to arrest its enraptured gaze, and unfathomable abysses of love and wisdom to contemplate, whose immensity will be as great after millions of æons shall have

elapsed, as when it was ushered into the Divine Presence, when it caught the first glimpse of the glory of the Beatific Vision, and experienced the first thrills of ecstasy in the contemplation of the fathomless, limitless ocean of God's infinite perfections. The soul will know God, but its knowledge will always be limited by the fact that it is created, that it is finite, that it is human, that its capacity is narrowed and restricted by its very nature, and is, therefore, incompetent to fathom the depths, or comprehend the immensity, of the ocean of Divine Wisdom and Divine Love, to comprehend, in a word, that which is immeasurable, and infinite, and eternal.

If, then, the blessed may drink for all eternity at the fountain of the Godhead, without exhausting or diminishing the infinitude of joy and love and knowledge which is there found, we should not be surprised to encounter difficulties and mysteries, in the natural as well as in the supernatural order, which are above and beyond our weak and circumscribed intellects. We admit,

and admit frankly, that there is much that we do not know, much that we can never comprehend. But our ignorance of many things does not make us skeptics in all things beyond the range of sense and experiment. We may not know God adequately, but we do know much about Him, aside from what He has been pleased to reveal regarding Himself. With St. Paul, we believe that "the invisible things of God from the creation of the world are clearly seen, being understood by the things that are made: His eternal power also and divinity."

Of the essence of God we can know nothing. Even of matter we are ignorant as to its essence. From the existence of the world, we infer the existence of God; for our primary intuitions teach us that there can be no effect without a cause. The evidences of order and design in the universe, prove the existence of a Creator who is intelligent, who has power and will, and who, therefore, is personal, and not the blind fate and impersonal energy and unknowable entity of the agnostic.

Gods of the Positivist and the Agnostic.

The gods of the heathen were manifold and grotesque, but what shall we say of the objects which the positivist and agnostic propose for our worship and love?

The Greeks and Romans gave Divine honors to demi-gods and heroes. Comte, one of the apostles of modern Agnosticism, affects to recoil before such gross idolatry; but is he more of a philosopher, or less of an idolator, when he proclaims that it is not man taken individually, or any particular man, but man taken collectively, man considered in the aggregate, that is to be regarded as the object of our cult? The Roman and the Athenian worshipped Apollo and Hercules, Jupiter and Venus; Comte says we must worship Humanity in its entirety. Huxley, however, dissents from this view, and tells us that it is not Humanity, but the Cosmos, the visible material universe, which should constitute the object of our highest veneration and religious emotion. Herbert Spencer is even more nebulous and mystical. His deity is

Unknowable Energy, "impersonal, unconscious, unthinking and unthinkable." God is "the great enigma which he [man] knows cannot be solved," and religion can at best be concerned only with "a consciousness of a mystery which can never be fathomed." According to Mr. Harrison, however — the brilliant critic of the views propounded by Huxley, the doughty combatant who has so frequently run full atilt against the champions of Agnosticism — Spencer's Unknowable is "an ever-present conundrum to be everlastingly given up;" his Something, or All-Being, is a pure negation, "an All-Nothingness, an x^n and an Everlasting No." Verily it is of such, "vain in their thoughts and darkened in their foolish heart," that the Apostle of the Gentiles speaks when he declares that they "changed the truth of God into a lie; and worshipped and served the creature rather than the Creator."

But it is not my purpose to dilate on the teachings of Agnosticism. My sole object is to indicate briefly some of its more patent and fundamental errors. A detailed examination and

refutation of them does not come within the purview of our subject. For such examination and refutation, the reader is referred to works which treat of these topics *ex professo*. It suffices for our present purpose to know the relation of Agnosticism to Evolution; to know that a particular phase of Evolution is so intimately connected with Agnosticism, that it cannot be disassociated from it, to realize that Agnosticism, and agnostic Evolution, are practically as synonymous as are Atheistic Evolution and Monism. It is enough for us to appreciate the fact that Agnosticism and Monism are fundamentally erroneous, to understand that both monistic and agnostic Evolution are untenable and inconsistent with the teaching of Theism and with the doctrines of Christianity; that they are illegitimate inductions from the known data of veritable science, and utterly at variance with the primary concepts of genuine philosophy. We need, consequently, consider them no further. Evolution, in the sense in which it is held by the Monist and Agnostic, is so obviously in positive

contradiction to the leading tenets of Theism, that it may forthwith be dismissed as not only untenable, but as unwarranted by fact and experiment, and negatived by the incontestable principles of sound metaphysics and Catholic Dogma.

CHAPTER V.

THEISM AND EVOLUTION.

Evolution and Faith.

HAVING eliminated from our discussion the forms of Evolution held by the divers schools of monists and agnostics, there now remains but the third form, known as theistic Evolution. Can we, then, consistently with the certain deductions of science and philosophy, and in accordance with the positive dogmas of faith—can we as Christians, as Catholics, who accept without reserve all the teachings of the Church, give our assent to theistic Evolution? This is a question of paramount importance, one which is daily growing in interest, and one for an answer to which the reading public has long been clamoring. And with it must also be answered a certain number of cognate questions, of scarcely less

interest and importance than the main question of Evolution itself.

I have elsewhere shown¹ that the principles of theistic Evolution—the Evolution, namely, which admits the existence of a God, and the development, under the action of His Providence, of the universe and all it contains—were accepted and defended by some of the most eminent Doctors of the early Greek and Latin Churches. It was a brilliant luminary of the Oriental Church, St. Gregory of Nyssa, who first clearly conceived and formulated the nebular hypothesis, which was long centuries subsequently elaborated by Laplace, Herschel and Faye. The learned prelate found no difficulty in admitting the action of secondary causes, in the formation of the universe from the primal matter which the Almighty had directly created. According to Gregory and his school, God created matter in a formless or nebulous condition, but impressed on this matter the power of developing into all

¹ "Bible, Science and Faith," part I, chaps. III and IV.

the various forms which it afterwards assumed. The universe and all it contains, the earth and all that inhabits it—plants, animals, man—were created by God, but they were created in different ways. The primitive material, the nebulous matter, from which all things were fashioned, was created by God directly, and immediately; whereas, all the multitudinous creatures of the visible world, were produced by Him indirectly and mediately, that is, by the operation of secondary causes and what are commonly called the laws of nature.

Teachings of St. Augustine.

St. Augustine not only accepted the conclusions of his illustrious Greek predecessor, but he went much further than the Bishop of Nyssa. He was, likewise, much more explicit, especially in what concerned the development of the various forms of animal and vegetable life. According to the Doctor of Hippo, God did not create the world as it now appears, but only the primordial matter of which it is composed. Not only the diverse forms of inorganic

matter—rocks, minerals, crystals—were created by the operation of secondary causes, but plants and animals were also the products of such causes. For God, the saint insists, created the manifold forms of terrestrial life, not directly but in germ; potentially and causally—*potentialiter atque causaliter*. In commenting on the words of Genesis: “Let the earth bring forth the green herb,” he declares that plants were created not directly and immediately, but causally and potentially, *in fieri, in causa*; that the earth received from God the power of producing herb and tree, *producendi accepisse virtutem*.

In his great work on the Trinity, the illustrious Doctor tells us that: “The hidden seeds of all things that are born corporeally and visibly, are concealed in the corporeal elements of the world.” We are unable to see them with our eyes, “but we can conjecture their existence from our reason.” They are quite different from “those seeds that are visible at once to our eyes, from fruits and living things.” It is indeed from such hidden and invisible seeds

that "The waters, at the bidding of the Creator, produced the first swimming creatures and fowl, and that the earth brought forth the first buds after their kind, and the first living creatures after their kind." They lay dormant, as it were, until long æons after the creation of matter, because "suitable combinations of circumstances were wanting, whereby they might be enabled to burst forth and complete their species."

"The world," he avers, "is pregnant with the causes of things that are coming to the birth; which are not created in it, except from the highest essence, where nothing either springs up or dies, either begins to be or ceases." But the Creator of these seeds, the Cause of these causes, *Causa causarum*, is at the same time the Creator of all things that exist. He carefully distinguishes "God creating and forming within, from the works of the creature which are applied from without." "In the creation of visible things it is God," he affirms, "that works from within, but the exterior operations," that is, the operations of creatures or those of divers

physical forces, "are applied by Him to that nature of things wherein He creates all things."

"For," the Saint continues, "it is one thing to make and administer the creature from the innermost and highest turning point of causation, which He alone does who is God, the Creator; but quite another thing to apply some operation from without, in proportion to the strength and faculties assigned to each by Him, that that which is created may come forth into being at this time or at that, or in this way or that way. For all things, in the way of origin and beginning, have already been created in a kind of texture of the elements, *in quadam textura elementorum*; but they can come forth only when opportunity offers, *acceptis opportunitatibus*."

God, then, according to St. Augustine, created matter directly and immediately. On this primordial or elementary matter He impressed certain causal reasons, *causales rationes*; that is, He gave it certain powers, and imposed on it certain laws, in virtue of which it evolved into all the myriad forms which we now behold. The saint does not tell us by what laws or

processes the Creator acted. He makes no attempt to determine what are the factors of organic development. He limits himself to a general statement of the fact of Evolution, of progress from the simple to the complex, from the homogeneous to the heterogeneous, from simple primordial elements to the countless, varied, complicated structures of animated nature.

Has any modern philosopher stated more clearly the salient facts of organic Evolution? Has anyone insisted more strongly on the reign of law in nature, or discriminated more keenly between the operations of the Creator and those of the creature? Has anyone realized more fully the functions of a First Cause, as compared with those of causes which are but secondary or physical? If so, I am not aware of it. Modern scientists have, indeed, a far more detailed knowledge of the divers forms of terrestrial life than had the philosophical Bishop of Hippo; they have a more comprehensive view of nature than was possible in his day, but they have not, with all their knowledge and superior

advantages, been able to formulate the general theory of Evolution a whit more clearly, than we find it expressed in the writings of the Doctor of Grace, who wrote nearly fifteen centuries ago.

Views of the Angelic Doctor.

The Angelic Doctor takes up the teachings of St. Augustine and makes them his own. He discusses them according to the scholastic method, and with a lucidity and a comprehensiveness that leave nothing to be desired. He carefully distinguishes between creation proper, and the production or generation of things from preëxisting material; between the operations of absolute Creative Energy, and those which may be performed by secondary causes. Indeed, so exhaustive and so complete is his treatment of the origin and Evolution of the material universe and all it contains; so clear and so conclusive his argumentation, that his successors have found but little to add to his brilliant propositions respecting the genesis of the world and its inhabitants.

The primordial Divine act of creation, according to St. Thomas, following St. Augustine, consisted in the creation, *ex nihilo*, of three classes of creatures; spiritual intelligences, the heavenly bodies and simple bodies, or elements. According to the physical theories of the time, the composition of the celestial bodies was supposed to be different from that of the earth. They were supposed to be incapable of generation or corruption;¹ to be constituted of elementary matter, indeed, but matter unlike that of sublunary bodies, in

¹ The scholastic use of the words "generation" and "corruption" must carefully be distinguished from the ordinary meaning of these terms. "In its widest sense," as Father Harper tells, "generation includes all new production even by the creative act. In a more restricted sense, it includes all transformations, accidental as well as substantial. In a still more restricted sense, substantial transformations only. Yet more specially, the natural production of living things; most specially, the natural production of man." Corruption, as understood by the Schoolmen, means, not "retrograde transformation, such as occurs, for instance, in the death of a living entity," but "the dissolution of a body by the expulsion of that substantial form by which it had been previously actuated. In the order of nature, it is the invariable accompaniment of generation." Cf. "Metaphysics of the School," vol. II, glossary, and pp. 273-279.

that it is incorruptible. We now know that mediæval philosophers were in error on this point. Spectrum analysis has demonstrated that all the celestial bodies have the same composition as our earth, and that the constitution of the material universe is identical throughout its vast expanse. Eliminating this error, which was one of physics, and not one of philosophy or theology, and one which in nowise impairs the teachings of the Angelic Doctor regarding creation, we have, according to St. Thomas, the creative act terminating in elementary matter and spiritual substance.

But here we must clearly distinguish between elementary matter, properly so called—the elements of which St. Thomas speaks—and primal matter, *materia prima*, which was given such prominence in the philosophical works of the Schoolmen. According to Aristotle, who follows Empedocles, there are four primitive elements, earth, air, fire and water; and from these, by suitable combinations, all other material substances are derived. The Scholastics,

in accepting the philosophy of the Stagirite, naturally adopted this theory of the four elements. Chemistry, however, has long since exploded this theory, as spectrum analysis has disproved the mediæval view regarding the composition of the heavenly bodies. But whether there are four elements, as the Schoolmen imagined, or some sixty odd, as modern chemists maintain, or but one only, as some of the old Greek philosophers believed, and as certain men of science still contend, it is quite immaterial so far as our present argument is concerned. What is necessary to bear in mind is, that the elementary matter of which the universe is composed, whether it be of one or of many kinds, was, in the beginning, created by God from nothing. For it is manifest that it was not the intention of the Angel of the Schools, to commit his followers to any mere physical theory respecting the number and nature of the elements, especially when the ideas entertained regarding these subjects were as vague and diverse as they are known to have been in his day. Neither he nor his

contemporaries had any means of throwing light on the questions involved. Even now, after all the splendid triumphs which chemistry has witnessed since the epoch-making achievements of Lavoisier, we are still in ignorance as to the exact number of elements existing, and are yet debating whether all the so-called elements may not be so many allotropic conditions of one and the same kind of matter. But what the Angelic Doctor did wish to insist on, what he wished specially to bring home to his hearers, was the great dogmatic truth according to which God is the Creator of all things, material and immaterial, visible and invisible.

Materia prima, however, as understood by the Scholastics, is quite different from what we know as elementary matter. In all bodies subject to generation and corruption, it is, they tell us, numerically one—*una numero in omnibus*. It is one and the same in all the components of the earth, and in all the constituent orbs of space. Of its very nature it is “ungenerated, ungen-

the property of
existing in space
more completely
distinct

erative, indivisible, incorruptible, indestructible." But this *materia prima*, although an entity, is not a complete substance. It cannot exist by itself, but must be actuated by some form. For it is form which determines matter and gives it being. An element, accordingly, is a composite entity, a *compositum*, constituted of matter—which is the subject, potentiality or inferior part of the composite—and form, which is the act or superior part. And although there is but one matter, there are many forms.¹ And it is because this one matter is actuated by diverse forms, that we have the manifold elements which constitute the material universe.

Seminales Rationes.

But these elements, composed of matter and form, required something more in order to be competent to enter into combinations and to give rise to higher and more complex substances.

¹For an elaborate explanation of the words "matter" and "form," see chaps. II and III, vol. II, of Harper's "Metaphysics of the School." Cf. also, § 48, vol. I of Ueberweg's "History of Philosophy."

This something more, the Angelic Doctor designates seminal forces, or influences—*seminales rationes*.

“The powers lodged in matter,” he tells us, “by which natural effects result, are called *seminales rationes*. The complete active powers in nature, with the corresponding passive powers—as heat and cold, the form of fire, the power of the sun, and the like—are called *seminales rationes*. They are called seminal, not by reason of any imperfection of entity that they may be supposed to have, like the formative virtue in seed; but because on the individual things at first created, such powers were conferred by the operations of the six days, so that out of them, as though from certain seeds, natural entities might be produced and multiplied.”

The physical forces—heat, light, electricity and magnetism—would, doubtless, in modern scientific terminology, correspond to the *seminales rationes* of the Angelic Doctor, as they are efficient in producing changes in matter and in disposing it for that gradual Evolution which has obtained in the material universe.

In the beginning, then, God created primordial matter, which was actuated

by various substantial forms. With the elements thus created were associated certain *seminal influences* — certain physical forces, we now should say—and the various compounds, which subsequently resulted from the action of these forces on the diverse elements created, were the product of generation and not of creation. There was development, Evolution, under the action of second causes, from the simple elements to the highest inorganic and organic compounds; from the lowest kinds of brute matter to the highest bodily representatives of animated nature; but there was nothing requiring anew creative action or extraordinary interventions, except, of course, the human soul.

After this primordial creation, God continued and sustained His work by His Providence. Matter was then under the action of secondary causes, under what science calls the reign of law, and under the action of these secondary causes, under the influence of forces and laws imposed on it by God in the beginning, it still remains, and shall remain, until time is no more.

Creation According to Scripture.

This teaching is in perfect harmony with the declarations of the opening chapter of Genesis, which speaks first of the creation of matter, then of the production from matter of plants and animals. It is consistent, too, with the teachings of science, which affirm that the material universe was once but a nebulous mass, which in the course of time condensed into solid bodies, the stars and planets, and which, after countless ages and by a gradual Evolution under the action of natural laws, generated those myriad objects of passing beauty and marvelous complexity which we now so much admire.

Matter alone, insists St. Thomas, in speaking of the visible universe, was created, in the strict sense of the term, and in this he but follows the indications of the Mosaic narrative of creation, and St. Augustine's interpretation of the work of the six days. Plants and animals were generated or produced from preëxisting material—"were gradually developed, by natural operations, under the Divine administration."

“In those first days,” he tells us, “God created the creature in its origin and cause—*originaliter, vel causaliter*, and afterwards rested from this work. Nevertheless, He subsequently, until now, works according to the administration of created things by the work of propagation. Now, to produce plants from the earth belongs to the work of propagation; therefore, on the third day plants were not produced in act, but only in their cause—*Non ergo in tertia die productæ sunt plantæ in actu sed causaliter tantum.*”

Elsewhere, in defending the opinion of St. Augustine, he writes :

“When it is said, ‘Let the earth bring forth the green herb,’ Gen. i, ii, it is not meant that plants were then produced actually in their proper nature, but that there was given to the earth a germinative power to produce plants by the work of propagation; so that the earth is then said to have brought forth the green herb and the tree yielding fruit in this wise, viz., that it received the power of producing them—*producendi accepisse virtutem.*”

And this he confirms by the authority of Scripture, Gen. ii, 4—where it is said:

“These are the generation of the heaven and the earth, when they were

created, in the day that the Lord God made the heaven and the earth, and every plant of the field, *before it sprung up* in the earth, and every herb in the ground *before it grew.*"

"From this passage," continues the Angelic Doctor, "two things are elicited: First, that all the works of the six days were created in the day that God made the heaven and earth and every plant of the field; and, accordingly, that plants, which are said to have been created on the third day, were produced at the same time that God created the heaven and the earth. Secondly, that plants were then produced, not in act, but according to causal virtues only; in that the power of producing them was given the earth—*fuerunt productæ non in actu, sed secundum rationes causales tantum, quia data fuit virtus terræ producendi illas.* This is meant, when it is said that it produced every plant of the field *before it actually sprang up in the earth* by the work of administration, and every herb of the earth *before it actually grew.* Prior, therefore, to their actually rising over the earth, they were made causally in the earth—*Ante ergo quam actu orirentur super terram, factæ sunt causaliter in terra.* This view is likewise confirmed by reason. For in those first days God created the

creature either in its cause or in its origin, or in act, in the work from which He afterwards rested. Nevertheless, He subsequently, until now, works according to the administration of created things by the work of propagation. But to produce plants in act out of the earth, belongs to the work of propagation; because it suffices for their production that they have the power of the heavenly bodies, as it were, for their father, and the efficacy of the earth in place of a mother. Therefore, plants were not actually produced on the third day, but only causally.¹ After the six days, however, they were actually produced according to their proper species, and in their proper nature by the work of administration." "In like manner fishes, birds and animals were produced in those six days causally and not actually—*Similiter pisces, aves et animalia in illis sex diebus causaliter et non actualiter producta sunt.*"

Such, then, is the teaching of the illustrious Bishop of Hippo and of the Angel of the Schools, respecting creation and the genesis of the material universe. To the striking passages just

¹ It will be noted that a portion of this extract from "De Potentia," is verbally identical with a part of what is found in the preceding quotation from the "Summa."

quoted, I can do nothing better than add Father Harper's beautiful and eloquent commentary as found in his splendid work, "The Metaphysics of the School."

"In the creation," declares the learned Jesuit, "represented by Moses in the manner best suited to the intellectual calibre of the chosen people, under the figure of six days—as St. Thomas, quoting from St. Augustine, remarks—the elements alone, among earthly things, were actually produced by the creative act; but simultaneously, in the primordial matter thus actuated by the elemental forms, a virtue was implanted, dispositive towards all the material forms conditionally necessary to the perfection of the earthly universe. But it was an ordered potentiality; so that in the after Evolution of the substantial forms, the lower should precede the higher; and that these latter should presuppose and virtually absorb the former. Thus were the figurative six days completed with the sowing of the seed of the future cosmos. Thereupon ensued a Sabbath of rest. The fresh, elemental world was sown with the germs of future beauty in diverse forms of life, in diversity of species, and possibly, varieties under the same

species. But these, as yet, lay hidden in the womb of nature. No earthly substance existed in act save the simple bodies; primordial matter under its first and lowest forms. Such was the earthly creation when the first Sabbath closed in upon it. After this Sabbath followed the order of Divine administration, wherein, as it continues to the present hour, the Divine Wisdom and Omnipotence superintended the natural Evolution of visible things, according to a constant order of His own appointing, amid ceaseless cycles of alternate corruptions and generations.

“Compound inanimate substances were first evolved by means of the seminal forces bestowed on nature. Then, from the bosom of these compounds sprang into being the green life of herb, plant and tree, gradually unfolding into higher and more complex forms of loveliness as the ages rolled on, according to the virtual order imprinted at first upon the obedient matter. Thence onward marched the grand procession of life, marking epochs as it went along, till it culminated in man, the paragon of God’s visible universe.”

The Divine Administration.

But what, it may be inquired, does St. Thomas mean by the work of Divine

administration? This phrase has been frequently employed, and it is of sufficient importance to demand an explanation.

No creature, as theology teaches, is competent to elicit a single act, even the smallest and most insignificant, without the coöperation of God. We cannot raise a foot, or move a finger, without Divine assistance. This is included in Divine administration, but it is far from being all that is so included. Over and above this the Divine administration embraces the order, or laws, by which the world is governed. It embraces, too, the Evolution of living things, without parentage, out of the potentiality of matter, or, what amounts to the same thing, it includes the proximate disposition of matter for the Evolution of organic from inorganic matter, and the higher from the lower forms of life. God, consequently, "must have been the sole efficient Cause of the organization requisite, and, therefore, in the strictest sense, He is said to have *formed* such living things, and, in particular, the human body, out of pre-existent matter."

In the teachings of St. Augustine and St. Thomas respecting the creation and Evolution of the sum of all things, there is nothing uncertain, equivocal or vacillating. True to the declaration of the Inspired Record, and true to the faith of the Church from the earliest ages of her history, they teach that in the beginning God created all things, visible and invisible, and that He still continues to protect and govern by His Providence all things which He hath made, "reaching from end to end mightily, and ordering all things sweetly." They tell us, not only that the Creator is "Lord of Heaven and earth, Almighty, Eternal, Immense, Incomprehensible, Infinite in intelligence, in will and in all perfections," not only that He is "absolutely simple and immutable spiritual substance, really and essentially distinct from the world," but also that he is omnipresent, omniscient ; that for Him there is no past nor future ; that all is present, and that "all things are bare and open to His eyes."

According to the Fathers and the Schoolmen, therefore, as well as

according to Catholic Dogma, God is the First Cause; finite beings are but secondary causes. God is the Primary Cause—*Causa causarum*; while all finite causes are merely instrumental. God is preëminently the integral and efficient Cause of all things, for He, preëminently, is the Cause “whence,” to use the words of Aristotle, “is the first beginning of change or of rest.”

Efficient Causality of Creatures.

But God, although the true, efficient Cause of all things, has willed, in order to manifest more clearly His wisdom and power and love, to receive the co-operation of His creatures, and to confer on them, as St. Thomas puts it, “the dignity of causality—*dignitatem causandi conferre voluit*.” It is not, however, as the Angelic Doctor declares, “from any indigence in God that He wants other causes for the act of production.” He does not require the co-operation of secondary causes because He is unable to dispense with their aid. He is none the less omnipotent because He has chosen to act in conjunction with

works of His own hand, for it is manifest that He who has created the causes, is able to produce the effects which proceed from such causes.

I have said that the efficient causality of creatures serves to disclose the wisdom and power and love of the Creator. It is true, but here again I shall quote from the eloquent and profound Father Harper, who so beautifully sums up all that may be said on the subject, that I need make no apology for quoting him in full.

The efficient causality of the creature serves to manifest God's wisdom, for, to quote Father Harper :

“ There is greater elaboration of design. To plan out a universe of finite entities, differing in essence and in grades of perfection, is doubtless a work of superhuman wisdom; but to include in the design the further idea of conferring on these entities a complex variety of forces, qualities, active and passive, faculties by virtue of which nature should ever grow out of itself and develop from lower to higher forms of existence, and should multiply along definite lines of being; to conceive a world whose constituents should

ceaselessly energize on one another, yet without confusion and in an admirable order ; to allow to the creature its own proper causality, and yet, even spite of the manifold action of free will in a countless multiplicity of immortal intelligences, to elaborate a perfect unity ; surely this is an incalculably higher manifestation of wisdom. It serves to manifest the power of the Creator ; for every cause is proportioned to the effect. But the completion of a design such as has been described, is a more noble effect than if every production of natural operation were the result of immediate creation. The manufacture of a watch is a noble work of art ; but if a watch should be made capable of constructing other watches in succession, and of winding up, regulating, cleaning, repairing its offspring, there is no one who would not be free to admit that the inventor would possess a virtue of operation incomparably superior to his fellow-men. It serves to manifest the love and goodness of the Creator ; since the Divine communication is more complete. Love shows itself in the desire of communicating its own perfection to the object of love ; it is essentially self-diffusive. By bestowing on the creature existence which is a likeness to His own existence, the Creator

communicates of His own, so to say, to the object of His charity ; but by bestowing likewise an intrinsic activity proportioned in each case to the exigencies of the particular nature, he completes the similitude. By this consummation of the creature He causes it to partake, in its own proper measure, of the diffusiveness of His goodness. There is nothing of solitariness in nature. By the very constitution of things, being is impelled to impart to being of its own perfection. Not only does the substantial form bestow upon the matter a specific determination, and the matter sustain the form in being ; not only does accident give its complement of perfection to substance, and substance give and preserve the being of accident ; not only does part conspire with part towards the completeness of the whole, and the whole delight in the welfare of each part ; but substance generates substance, accident, in its way, accident, and the whole visible universe is knit together in the solidarity of a common need and of mutual support. Passing upwards, the orders of spiritual being, both those that are included in the visible creation and those which are pure intelligences, bear in the activity of their will, which acts upon all that is around it, a yet nearer resemblance to

the charity of the Creator. Assuredly, then, the causal activity of finite being is not superfluous ; even though God can, by His sole omnipotence, do all that is effected by His creature."

Such then, is the theistic conception of Evolution; such the Catholic idea as developed and taught by the Church's most eminent saints and Doctors. It were easy to add the testimony of other philosophers and theologians; but this is not necessary. It is not my purpose to write a treatise on the subject, but merely to indicate by the declarations of a few accredited witnesses, to show from the teachings of those "whose praise is in all the churches," that there is nothing in Evolution, properly understood, which is antagonistic either to revelation or Dogma; that, on the contrary, far from being opposed to faith, Evolution, as taught by St. Augustine and St. Thomas Aquinas, is the most reasonable view, and the one most in harmony with the explicit declarations of the Genesiac narrative of creation. This the Angelic Doctor admits in so many words. God could, indeed, have

created all things directly; He could have dispensed with the coöperation of secondary causes; He could have remained in all things the sole immediate efficient Cause, but in His infinite wisdom He chose to order otherwise.

Anthropomorphism.

But not only does the theistic Evolution of St. Augustine and the Angelic Doctor exclude special creations; it dispels as completely all anthropomorphic views of the Deity, and is at the same time thoroughly opposed to the doctrine of constant Divine interference in the operations of nature.

St. Augustine shows how distasteful Anthropomorphism is to him when, among other things, he declares:

“To suppose that God formed man from the dust with bodily hands is very childish. . . . God neither formed man with bodily hands nor did He breathe upon him with throat and lips.”

We know, indeed, that God created all things from nothing, but we cannot imagine, nay, we cannot conceive *how* He created. We know that the universe came into existence in virtue of a simple

Divine fiat, but no human intellect is able to conceive *how* matter and spirit were educed from nothingness into actuality. The very feebleness and limitations of human language and human thought compel us, when speaking of God and His operations, to employ terms that often but faintly adumbrate the magnificent realities of which we can never form an adequate conception. We speak of God as creator, as giving ear to the prayers of His creatures, as being holy, just, powerful, omniscient, omnipresent, but we do not thereby think of Him as some sort of magnified man, as skeptics are often wont to assert. When we speak of the attributes and perfections of the Deity, we must needs use the same terms as when we speak of corresponding attributes and perfections in man. This, however, does not necessarily imply an anthropomorphic conception of God, and still less does it, as is so often assumed, imply the alternative of a blank and hopeless skepticism.

“God,” as a scholarly writer truthfully observes, “contains in Himself all human perfections, but not in the same

manner as they exist in man. In man they are limited, dependent, conditioned, imperfect, finite nature. In God they are unlimited, independent, absolute, perfect, infinite nature. In man they can be separated one from the other; in God they are all one and the same, and we can distinguish the Divine attributes after our human fashion, only because their perfect and absolute unity contains virtually in itself an infinite multiplicity. In man they are essentially human; in God they are all Divine. In man they belong to the lower and created order; in God, to a higher and uncreated order. In man any moral perfection may be present or absent without the essential nature of man being thereby affected; in God, the absence of any perfection would thereby rob Him *ipso facto* of His Deity. Whatever the human attribute can perform, the Divine attribute can do in a far more perfect way, and the most exalted exhibition of human perfection is but a faint shadow of the Divine perfection that gave it birth. The most unbounded charity, mercy, gentleness, compassion, in man, is feeble indeed, and miserable, compared with the charity, mercy, gentleness, compassion of God. The Divine perfection is the ideal of human perfection, its model, its

pattern, its origin, its efficient Cause, the source from which it came, the end for which it was created.”¹

Divine Interference.

Theistic Evolution, in the sense in which it is advocated by St. Augustine and St. Thomas, excludes also Divine interference, or constant unnecessary interventions on the part of the Deity, as effectually as it does a low and narrow Anthropomorphism. Both these illustrious Doctors declare explicitly, that “in the institution of nature we do not look for miracles, but for the laws of nature.”

Only the crudest conception of derivative creation would demand that the theist should necessarily, if consistent, have recourse to continued creative fiats to explain the multifold phenomena connected with inorganic or organic Evolution. For, as already explained, derivation or secondary creation is not, properly speaking, a supernatural act. It is merely the indirect action of Deity by and through natural causes. The

¹ *The Month*, Sept. 1882, p. 20.

action of God in the order of nature is concurrent and overruling, indeed, but is not miraculous in the sense in which the word "miraculous" is ordinarily understood. He operates by and through the laws which He instituted in the beginning, and which are still maintained by His Providence. Neither the doctrine of the Angel of the Schools nor that of the Bishop of Hippo, requires the perpetual manifestation of miraculous powers, interventions or catastrophes. They do not necessitate the interference with, or the dispensation from, the laws of nature, but admit and defend their existence and their continuous and regular and natural action. Only a misunderstanding of terms, only a gross misapprehension of the meaning of the word "creation," only, in fine, the "unconscious Anthropomorphisms" of the Agnostic and the Monist, would lead one to find anything irreconcilable between the legitimate inductions of science and the certain and explicit declarations of Dogma.

Science and Creation.

From what has already been learned, it is manifest that physical science is utterly incompetent to pronounce on primary or absolute creation. This, being by the very nature of the case, above and beyond observation and experiment, it is, for the same reason, necessarily above and beyond the sphere of science or Evolution. The Rev. Baden Powell clearly expresses this idea in his "Philosophy of Creation," when he affirms :

"Science demonstrates incessant past changes, and dimly points to yet earlier links in a more vast series of development of material existence; but the idea of a *beginning*, or of *creation*, in the sense of the original operation of the Divine volition to constitute nature and matter, is beyond the province of physical philosophy."

Again, belief in derivative creation is secure from attack, on the part of natural science, for the simple reason that it does not repose on physical phenomena at all, but on psychical reasons, or on our primary intuitions. Modern scientists are continually confounding pri-

mary with secondary creation, and speaking of the latter as if it were absolute creation, or as if it implied special supernatural action. This confusion of terms is at the bottom of many of the utterances of Darwin and Huxley, and is the cause of numerous erroneous views which they ascribe to their opponents. Thus, Darwin asks those who are not prepared to assent to his evolutionary notions, if "they really believe that at innumerable periods in the earth's history, certain elemental atoms have been commanded suddenly to flash into living tissues?" And Huxley ridicules the notion that "a rhinoceros tichorhinus suddenly started from the ground like Milton's lion, 'pawing to get free its hinder parts,'" and facetiously speaks of the improbability of "the sudden concurrence of half-a-ton of inorganic molecules into a live rhinoceros."

A grave objection, quotha! As if a belief in creation necessarily connoted the grotesque assumptions which he attributes to those who are not of his mind, Huxley and Darwin set up poor, impotent dummies, and forthwith proceed

to knock them down, and then imagine they have proven the views of their adversaries to be untenable, if not absurd. A reference to what has already been said respecting absolute and derivative creation, and a recollection that creation by and through secondary causes is not a supernatural, but a natural act, will show how much ignorance of the elench there is in the difficulty suggested by the two naturalists just named.

Limitations of Specialists.

In Darwin's case, one is not surprised that he should, in good faith, urge the objection included in the quotation just made from him, because he informs us himself that he was mentally disqualified for the discussion of abstract or metaphysical questions. "My power," he writes in his autobiography, "to follow a long and purely abstract train of thought, is very limited; and therefore I could never have succeeded with metaphysics or mathematics." But aside from his incompetence as a metaphysician, the very doctrine he championed

so lustily seemed to render him nebulous and skeptical even about primary intuitions. Having occasion to give an opinion on the "Creed of Science," he wrote :

"The horrid doubt always arises whether the convictions of man's mind, which has been developed from the mind of the lower animals, are of any value, or at all trustworthy. Would anyone trust in the convictions of a monkey's mind, if there are any convictions in such a mind?"

One is not surprised, I repeat, to find metaphysical and theological errors in Darwin's works, for, in addition to his acknowledged incapacity in abstract subjects, his mind was so preoccupied with biology in its bearings on Evolution, that he was practically indifferent to, if not oblivious of, everything outside his immediate sphere of research. He is, indeed, a striking illustration of the truth of Cardinal Newman's observations when he declares :

"Any one study, of whatever kind, exclusively pursued, deadens in the mind the interest, nay, the perception of any other. Thus, Cicero says, Plato and Demosthenes, Aristotle and Isocrates, might

have respectively excelled in each other's province, but that each was absorbed in his own. Specimens of this peculiarity occur every day. You can hardly persuade some men to talk about anything but their own pursuits; they refer the whole world to their own center, and measure all matters by their own rule, like the fisherman in the drama, whose eulogy on his deceased lord was, 'he was so fond of fish.' "

But the observations of the learned cardinal are not more applicable to Darwin than to a host of contemporary scientists, who fancy there is an irreconcilable conflict between science on the one hand, and religion on the other. They fail to see that the conflict, so far as it exists, is due either to bias or ignorance, or to the fact that the very nature of their studies has imposed limitations on them, which utterly unfit them for pronouncing an opinion on the subjects which they are often in such haste to discuss.

Evolution and Catholic Teaching.

From the foregoing pages, then, it is clear that far from being opposed to faith, theistic Evolution is, on the

contrary, supported both by the declarations of Genesis and by the most venerable philosophical and theological authorities of the Church. I have mentioned specially St. Augustine and St. Thomas, because of their exalted position as saints and Doctors, but it were an easy matter to adduce the testimony of others scarcely less renowned for their philosophical acumen and for their proved and unquestioned orthodoxy; but this is unnecessary. Of course no one would think of maintaining that any of the Fathers or Doctors of the Church taught Evolution in the sense in which it is now understood. They did not do this for the simple reason that the subject had not even been broached in its present form, and because its formulation as a theory, under its present aspect, was impossible before men of science had in their possession the accumulated results of the observation and research of these latter times. But they did all that was necessary fully to justify my present contention; they laid down principles which are perfectly compatible with theistic

Evolution. They asserted, in the most positive and explicit manner, the doctrine of derivative creation as against the theory of a perpetual direct creation of organisms, and turned the weight of their great authority in favor of the doctrine that God administers the material universe by natural laws and not by constant miraculous interventions. As far as the present argument is concerned, this distinct enunciation of principles makes for my thesis quite as much as would the promulgation of a more detailed theory of Evolution.

The Scholastic Doctrine of Species.

It may, however, be objected, that the authorities so far quoted favor development only in a vague or general way; that the Fathers and Scholastics distinctly maintained certain views which are absolutely incompatible with Evolution as now understood. It is said, for instance, that the scholastic doctrine of species, to which all the Schoolmen are irrevocably committed, completely negatives the view that their principles are compatible with organic

development. We are told that one of the cardinal doctrines of the School is the immutability of species ; that species are but realizations of the archetypes, the "grand ideas," which have existed from all eternity in the mind of the Creator ; that to affirm the immutability of species would be tantamount to asserting a change in the Divine prototypes, or to predicating a mutation in the Divine Essence itself.

In answer to this objection I shall confine myself to the teachings of the Angelic Doctor alone, as I am perfectly willing to rest my case for Evolution on his certain teachings respecting the nature of species.

It is necessary to premise here, that in the inductive sciences, St. Thomas, like his illustrious master, St. Augustine, teaches that disputed points are not to be settled by *a priori* reasoning, but rather by observation and experiment. No one, therefore, who is even slightly acquainted with the mind of the Angelic Doctor, and who duly appreciates his penetrating and comprehensive genius, would for a moment credit him with

binding his disciples and successors to metaphysical formulæ, in matters of experimental science and thus obliging them to reject the results of experiment and observation when they might happen to contravene the dicta or assumptions of metaphysics. Such an imputation would not be borne out by his teaching and would be as unjust as it would be erroneous.

To remove ambiguity and clear away difficulties, it may be observed that the word "species" may be envisaged under three different aspects, to wit: the metaphysical, the logical, and the physiological or real. As to the metaphysical and logical aspects, both the Angelic Doctor and the School generally, are one in attributing to species an absolute fixity.

With metaphysical and logical species, however, we are not at present concerned. I am quite willing to leave these to the metaphysician to treat them as he lists. The question now at issue regards only physiological species. Is the species of which the biologist speaks variable, or does it belong to

the category of immutable metaphysical species? This is a question of science and not of metaphysics. If it can be proven by the sciences of observation and experiment, that species are permanent and invariable, then the real or physiological species of the naturalist, in so far as they are immutable, at once enter into the category of the metaphysical species of the School. If, on the contrary, science can demonstrate that species are variable, then the fancied identity of physiological and metaphysical species immediately disappears. The determination, however, whether living types, plant or animal, are variable or permanent; whether physiological species shall be classed in the same category as immutable metaphysical species, is, I repeat, a matter not of *a priori* reasoning, but wholly and solely one of observation and experiment.

In his "Summa" the Angelic Doctor admits, without hesitation, the possibility of a new species, for he tells us :

"New species, if they make their appearance, preëxisted in certain active

virtues, as animals are produced from carrion under the influence communicated in the beginning to the stars and the elements."

More than this, he distinctly admits the mutability of species. To the objection that species must be immutable because they correspond with archetypes in the Divine intelligence, that they must be immutable because their forms are essentially immutable, he replies, that "immutability is proper to God only," and that "forms are subject to the variations of the reality."

Again, it is erroneously supposed that St. Thomas always attaches to the terms genus and species, the same meaning as is given them by modern naturalists. This is a grave misapprehension. It will suffice to adduce a single instance in disproof of this notion. For example, the Angelic Doctor places man and animal in the same genus. But, if, in the mind of St. Thomas, the word genus were in this instance to be understood in its modern sense, it would, as Père Leroy puts it, be tantamount to admitting the "principle of

materialism." Obviously, therefore, the term genus is to be understood in a much more comprehensive sense. For a similar reason, species, the immediate subdivision of genus, must likewise have a much wider signification than it has in a strict technical sense. If we desire to have a measure of the relative amplitude of species as compared with genus, in the passage just quoted, in which genus is made to embrace man and animal, we must, as Père Leroy pertinently remarks, make *spécies* correspond to what naturalists now denominate a kingdom. Thus understood, species, in the instance referred to, would be immutable, but not otherwise.

It is a mistake, then, to suppose that the meaning of the term species, in its physiological sense, was fixed by the Angelic Doctor. Neither did it receive the signification afterwards ascribed to it from any of the other Schoolmen or mediæval theologians. Nor does such a meaning find any warrant in the teachings of the Fathers or in Scripture. Whence, then, the origin of the word in the sense so long attributed to it by

special creationists? This is a question deserving of consideration, for an answer to it, if it does not remove wholly many difficulties, will at least clear the field for intelligent discussion.

Milton and Ray.

Incredible as it may seem, it was a poet who fastened on science the signification which the word "species" has so long borne. Prior to Milton's time the meaning of the term, as employed by naturalists, was vague and changeable in the extreme. Not so, however, after the appearance of "*Paradise Lost*." At once the account of creation, as given in this immortal poem, began to be regarded as "a sort of inspired gloss on the early chapters of *Genesis*," and the botanist Ray, a younger contemporary of Milton, had, accordingly, no difficulty in giving to the word "species" a meaning which became as definite in natural history, as it had long before been in logic and metaphysics. The work of Milton and Ray was complete. What naturalists from the time of Aristotle had been un-

able to do, was effected in less than a generation by a poet and a botanist. And so universally was their meaning of the word accepted, that it persisted in natural history usage, and almost without any objections being raised against it, for full two hundred years. It was adopted by Linnæus and given wide-spread currency in the numerous works of the illustrious Swede. It was accepted by the great Cuvier and his school, and thus a definition of a single word, the meaning of which hinged on a well-known episode in a celebrated poem, served for two centuries to give permanency to a doctrine which, notwithstanding the progress Evolution has made, still has its supporters in all parts of the world. Species were assumed to be fixed and invariable, because the definition of the term, not the facts of nature, demanded it. Logical and metaphysical species were confounded with physiological or real species. For this reason, as is apparent, the foundation of the rival theory of Evolution, special creation, rests on an assumption; an assumption which, in

turn, is based on a misconception of terms, on what, in the last resort, is a verbal fallacy pure and simple. Indeed, the history of the word "species" is but another of the countless illustrations of the sage observation of Coleridge, that "errors in nomenclature are apt to avenge themselves by generating errors of idea;" errors which, in turn, generate other errors and retard progress in a way that cannot be estimated.

The scholastic teaching respecting species does not, then, as is so often erroneously imagined, commit us to the doctrine of the immutability of species. Far from it. The question of the mutability or permanence of physiological species, the question of organic Evolution, therefore, is, as just stated, one to be settled by empirical science, by observation and experiment, and not by metaphysics.

CHAPTER VI.

THE ORIGIN AND NATURE OF LIFE.

Spontaneous Generation.

OUR next inquiry is concerning the teachings of the Fathers and the Schoolmen in respect of the origin and nature of life, and what views one may, consistently with revealed truth and Catholic Dogma, entertain regarding this all-important topic. These are questions, as is well known, in which evolutionists of all classes, monistic, agnostic, and theistic, are specially interested, and questions, consequently, which cannot be passed over in silence.

The lower forms of life, were supposed by Greek and mediæval philosophers to have originated spontaneously from the earth, or from putrefying organic matter. From the time of Aristotle to that of Redi, the doctrine of spontaneous generation was accepted without question, and it is scarcely yet

a generation since the brilliant experiments of Pasteur drove abiogenesis from its last stronghold.

For over two thousand years the most extravagant notions were prevalent regarding certain of the smaller animals. Virgil, in his famous episode of Aristaëus, tells us of the memorable discovery of the old Arcadian for the production of bees from the tainted gore of slain bullocks. But this is but an echo of what was universally believed and taught. Not only was it thought that putrefying flesh gave rise to insects, and other minute animals, but it was the current opinion that different kinds of carrion generated diverse forms of life. Thus, as bees were produced from decomposing beef, so beetles were generated from horseflesh, grass-hoppers from mules, scorpions from crabs, and toads from ducks. Diodorus Siculus speaks of multitudes of animals developed from the sun-warmed slime of the Nile valley. Plutarch assures us that the soil of Egypt spontaneously generates rats, and Pliny is ready to confirm the statement by an example of a rat,

half metamorphosed, found in the Thebaid, of which the anterior half was that of a fully developed rodent, while the posterior half was entirely of stone! The Fathers and the Schoolmen, as we have seen, made no hesitation in accepting the doctrine of spontaneous generation. But while ready to admit abiogenesis as a fact, they gave it a different interpretation from what it had received from the philosophers and naturalists of Greece and Rome. According to Epicurus: "The earth is the mother of all living things, and from this simple origin not even man is excepted." Brute matter, said the Epicureans—as Hæckel and his school now proclaim—generates of its own power both vegetable and animal life; that is, non-living gives rise to living matter. But Christian philosophy, contrariwise, teaches that it is impossible for inorganic to produce organic matter *motu proprio*, or by any natural inherent powers it may possess. "The waters," declares St. Basil, in speaking of the work of creation, "were gifted with productive power, but this power was communicated to them by God."

“From slime and muddy places, frogs, flies and gnats came into being,” he was willing to admit, “but this was in virtue of a certain germinative force conferred on matter by the Author of nature.” “Certain very small animals may not have been created on the fifth and sixth days,” opines St. Augustine, “but may have originated later from putrefying matter,” but still, even in this case, God it is who is their Creator.

Spontaneous generation, therefore, was never a stumbling block either to the Fathers or Scholastics, because the creative act was always acknowledged, and because God was ever recognized as the Author, at least through second agents, of the diverse forms of life which were supposed to originate from inorganic matter. Whether He created all things absolutely and directly, or mediately and indirectly, it mattered not, so long as it was understood that nothing could exist without His will and coöperation. Whether, then the germ of life was specially created for each individual creature, or whether matter was endowed with the power of

evolving what we call life, by the proper collocation of the atoms and molecules of which matter is constituted, was, from their point of view, immaterial, so far as dogma was concerned. The doctrine of spontaneous generation might be an error, scientifically, but, even if so, there was nothing in it contrary to the truths of revelation. It was always and fully recognized that God was the sole and absolute Creator of matter, and that He, by the action of powers conferred on matter by certain seminal forces, as the Scholastics taught, disposed matter for the assumption of all the multitudinous forms into which it subsequently developed.

The Nature of Life.

Respecting the real nature, not the origin, of life, there have, indeed, been many and diverse opinions. Even now it is almost as much of an enigma as it was in the days of Aristotle, and we are at present, apparently, no better qualified to give a true definition of life than was the great Stagirite, twenty-three centuries ago. Living beings can, indeed,

be distinguished from non-living beings by their structure, mode of genesis, and development, but this does not help us toward a clear and precise definition of life.

According to the philosophers of antiquity there was a certain independent entity, or vital principle, which, uniting with the body, gives life, and, separating from it, causes death. Plato and Aristotle, as is well known, admitted the existence of three souls, or animating spirits, the vegetative for plants, the vegetative and sensitive for animals; and for man, an intelligent and reasoning spirit in addition to those possessed by plants and animals. Paracelsus and Van Helmont spoke of the principle of life under the name of *archæus*, and attempted to explain vital functions by chemical agencies. Others, still, "made the chyle effervesce in the heart, under the influence of salt and sulphur, which took fire together and produced the vital flame!"

Bichat defines life as "the sum total of the functions which resist death;" Herbert Spencer makes it "the con-

tinuous adjustment of internal relations to external relations," while Oliver Wendell Holmes tells us, that "Life is the state of an organized being in which it maintains, or is capable of maintaining, its structural integrity, by the constant interchange of elements with the surrounding media."

Such definitions, however, are almost as vague and unsatisfactory as the notions implied in the "spirits" of Aristotle and Plato, and in the archæus of Van Helmont and Paracelsus. They afford us no clearer conception of what life really is in itself, of what it is that constitutes the essential difference between living and non-living matter, than we may derive from the idea of Hippocrates, who regarded "unintelligent nature as the mysterious agent in the vital processes."

But whatever views we may entertain respecting the actual nature of life; whether we regard it as a force entirely different in kind from the purely physical forces, or look upon it as a special coördination and integration of physical forces, acting in some mysterious way



on inanimate matter, and in such wise as to cause it to exhibit what we call the phenomena of life, the fact still remains, that at some period in the past history of our planet, the first germ of organic life made its appearance, and that, too, independent of any antecedent terrestrial germ.

The Germ of Life.

Whence this primordial germ, this first electric spark, which effected the combination of inorganic elements and transmuted non-living into living matter? Is it an "intellectual necessity" that we should, with Tyndall, "cross the boundary of the experimental evidence and discover in matter the promise and potency of all terrestrial life?" Must we believe with Lucretius that nature "does all things spontaneously of herself, without the meddling of the gods;" and are we forced to regard matter and life as indissolubly joined, as entities which cannot be divorced from one another even in imagination? These are questions which are constantly recurring, and

while in no wise sharing the materialistic views of Tyndall and Lucretius, we are, nevertheless, forced to admit that the problems involved are as difficult to solve as those concerning the nature of life itself.

In 1871, Sir William Thomson (Lord Kelvin), in an address at Edinburgh, discussed a theory which had been broached by a German speculator, Prof. Richter of Dresden, and involved the careering through space of "seed-bearing meteoric stones," and the possibility of "one such falling on the earth," and causing it, "by what we blindly call natural causes," to become "covered with vegetation." "The hypothesis," the distinguished physicist tells us, "may seem wild and visionary; all I maintain is, it is not unscientific."

But even if it were proved that the first germ of life had been brought by some seed-bearing meteorite from the depths of space, or from some far distant world, it would, as is obvious, afford no explanation either of the real nature or of the ultimate origin of life. It would

be but removing the difficulty farther away; not giving it a solution.

Still another question confronts us. Was there but one primordial germ, the origin and parent of all the multitudinous forms of life which now variegate and beautify the earth, or were there many germs independently implanted in the prepared soil of this globe of ours? And if many, did they make their appearance simultaneously, or at different and widely separated periods and localities?

Darwin inclines to the belief that "all animals and plants are descended from some one prototype." From this prototype, or primordial germ, as from a common root, is developed "the great tree of organic life," a tree which is conceived as having "two main trunks, one representing the vegetable and one the animal world," while each trunk is pictured as "dividing into a few main branches," the branches subdividing into a number of branchlets, and these, in turn, into "smaller groups or twigs." Prof. Weismann, on the other hand, is of the opinion that not

one, but numerous organisms first arose "spontaneously, simultaneously, and independently one of the other."

Such considerations as the foregoing, and the diverse and contradictory opinions to which they have given rise, compel one, will-he nill-he, to recognize the fact that science, I mean experimental science, can tell us nothing more about the origin of life than it can regarding the origin of matter. These are questions which, by their very nature, are outside the sphere of inductive research, and their answers, so far as observation and experiment are concerned, must ever remain in inscrutable and insoluble mystery.

Abiogenesis.

So far as science can pronounce on the matter, spontaneous generation, as we have already learned, is, in the language of Pasteur, but a chimera. Even those whose theories imply, if they do not demand, the spontaneous origination of living from non-living matter, are forced to admit that there is, as yet, no warranty whatever for believing that

abiogenesis obtains now, or ever has obtained, at any time in the past history of our globe.

But suppose that some time or other it should be proved, that spontaneous generation not only has taken place, but that it actually occurs, *hic et nunc*? The fact that we have as yet no evidence that it ever has taken place, or that it does not occur now, does not prove that it is impossible. We may not be prepared to affirm, with Huxley and Fiske, that it *must have* taken place at some period in past history, but may we not admit the possibility of the occurrence? We certainly do not agree with Hæckel that we renounce our reason if we believe in a special Divine intervention for the production of life. Nor do we admit that spontaneous generation was “a *necessary* event in the process of the development of the earth,” because we contend that so far as observation and experiment go, they can tell us nothing more about the nature and origin of life than they tell us about the origin of matter. And yet, notwithstanding the last words of Van Beneden and Pasteur,

regarding the origination of entozoa and microbes from antecedent life, it is quite conceivable that with the progress of research and the development of more delicate and powerful instruments of observation, it may one day be demonstrated that spontaneous generation not only can occur, but actually does occur daily in millions of cases, in forms of life as far below microbes in size and structure as these are below the entozoa. Without hesitation, therefore, we can subscribe to the declaration of Huxley when he states :

“ With organic chemistry, molecular physics and physiology yet in their infancy, and every day making prodigious strides, I think it would be the height of presumption for any man to say that the conditions under which matter assumes the properties we call ‘vital,’ may not, some day, be artificially brought together.”

Artificial Production of Life.

Should, then, such a discovery be made, as is possible and conceivable—I do not say probable—should some fortunate investigator some day detect, in

the great laboratory of nature, the transition of inorganic into organic and animated matter, or should he, by some happy chance, be able to transmute non-living into living matter, would there be in such a discovery aught that would contravene revealed truth, or militate against any of the received dogmas of the Church?

To this question we can at once, and without hesitation, return an emphatic negative. The reply has, indeed, been indicated in the preceding pages, when discussing the views of the Fathers and the Schoolmen respecting spontaneous generation. Not only were they all fully persuaded of the fact of abiogenesis, in the case of certain of the lower forms of life, but they also laid down principles which are quite compatible with the origination from brute matter not only of the lower, but also of the higher animals. Far from being opposed to the Evolution of living from non-living matter, they, in many instances, favored it as the more probable hypothesis. But their views as to the efficient causes of such Evolution differed *toto*

caelo from those entertained by modern monists and agnostics. The latter attribute to brute matter, which, by its very nature, is passive and inert, the power of passing unaided from a lower to a higher plane. They completely ignore the true formal and efficient causes of development, and base their theories exclusively upon a cause which is purely material. Not so the Fathers and Doctors of the Church. They tell us that "the primordial elements alone were created in the strict sense of the term, and that the rest of nature was gradually developed out of these, according to a fixed order of natural operation, under the supreme guidance of Divine administration." They teach that if spontaneous generation be, indeed, a reality, the matter which undergoes change, "having been proximately disposed, by the action of heat and of other causes, of itself evolves into act by Divine intervention, rather than that the causal action of an inanimate body should be efficacious towards the generation of life."

As to the artificial production of

living from non-living matter, of which sundry enthusiastic chemists have so fondly dreamed, it can be positively asserted that if ever effected it will be along lines quite different from those which certain over-sanguine speculators have indicated.

The great feat achieved by Wöhler, in 1828, in making urea—an organic compound, previously supposed to be the result of vital forces alone—from inorganic matter, was but the prelude of those brilliant triumphs of synthetic chemistry which since have so frequently astonished the world. During the past few decades, especially, organic compounds of the most marvelous complexity have been manufactured in the laboratory, until now there are not wanting chemists who affect to hope, that they will one day be able to rival nature herself in the number and complexity of her products. Their powers of analysis, we are willing to concede, are practically unlimited. They can tell us not only the composition of the divers compounds of the mineral world, but they are also able to give us the formulæ

of the most complex constituents of vegetable and animal tissue. And as time rolls on, the chemist's mastery over matter and the forces of nature grows apace, and often at a rate that is astonishing to the chemist himself. He now plays with atoms and molecules as a juggler manipulates spheres of brass, and so great is his knowledge of affinities and equivalences, so complete his command over the hidden forces of allotropism and isomerism, that he can, with the utmost ease, accomplish what a few years ago would have been regarded as thaumaturgy of the highest order.

Protoplasm.

The compound which has received the greatest share of attention, from those who have been looking forward to the ultimate production of animate matter, is protoplasm. This is the substance to which Huxley has given so much notoriety under the designation of "The Physical Basis of Life."

Chemically, protoplasm is composed of carbon, oxygen, hydrogen and nitrogen. At first it was regarded as a kind

Quality of existing in 2 or more conditions chemically distinct, as carbon may be hard in diamonds, & soft in lampblack.

* Chemically identical but physically different as in their action on polarized light.

of albumen, called protein, and was viewed as a single compound of homogeneous structure. It was spoken of as "a kind of matter which is common to all living beings," plants as well as animals; "a single physical basis of life underlying all the diversities of vital existence." "It is," says Huxley, "the potter's clay," out of which all the Protean forms of animal and plant life are fashioned.

Now, however, all this is changed. Protoplasm, it has been discovered, is not a single chemical compound with a definite and constant molecular structure, as was formerly taught. It is something vastly different. Microscopy and micro-chemistry have demonstrated that it is composed of a dozen or more substances, all of the greatest complexity. Far from being a single, homogeneous, transparent, structureless jelly, as described some years ago, and as still conceived by many who glibly talk about it, protoplasm, on the contrary, is a most highly organized structure, composed of complex liquid matter, granules, fibres, tubules, nuclein, and

exhibiting in the living organism the most marvelous properties and the most wonderful activity. Indeed, protoplasm is a word that has almost vanished from the nomenclature of the cytologist. And in its place we have a score or more of new terms, to designate the constituents of what was but a few years ago regarded, even by the ablest exponents of science, as a single chemical compound of uniform composition. Thus, in lieu of protoplasm, we now have nuclein, pyrenin, and nucleoplasm; paranuclein, amphipyrenin, and karyoplasm, not to mention other compounds equally remarkable and complicated.

Such being the case, there is obviously no more hope of the chemist eventually being able to manufacture protoplasm, than there is of his being able to produce a polyp or a sea-urchin. He may build up from their simple elements complex compounds like urea, formic acid and indigo, because these have a definite molecular composition, but he can no more make even a microscopic speck of protoplasm than he can fashion a rose or a butterfly.

Another consequence follows from the recent discoveries regarding protoplasm, and that is, the impossibility of originating life. If protoplasm is the simplest form of matter in which life exists, and if it is impossible to manufacture even the smallest particle of inanimate protoplasm, much less living protoplasm, it is *a fortiori* impossible to produce an entity exhibiting the phenomena characteristic of a living being.

For a similar reason, all likelihood of discovering evidence in favor of spontaneous generation has vanished. One may not, indeed, assert that it is entirely impossible. So far, it is true, protoplasm is the simplest substance which exhibits the phenomena of life, and we know of no kind of protoplasm which is simpler than that above mentioned. This, however, does not imply that there are not simpler forms of living matter. It is possible that there are living beings so simple that their composition may be represented exactly by a chemical formula; that they have a fixed, definite, molecular arrangement,

like some of our complex organic compounds. It is possible that ultimately the chemist may discover the proximate constituents of such a substance and be able to indicate how it is produced by nature, or how it may be manufactured in an inanimate condition in the laboratory. All this is possible, all conceivable. The past triumphs of organic chemistry, as well as our increasing knowledge of the lower forms of life, permit such an assumption. Yet it is only an assumption. But so far as protoplasm is concerned, so far as there is question of the simplest unicellular moner which the microscopist has yet observed, we can unhesitatingly say that spontaneous generation is impossible. We may conceive how simple chemical forces can produce a chemical compound of even the greatest complexity. But we cannot picture to ourselves how such forces, unaided and alone, can produce an intricate organism, such as is even the lowest representative of animate nature. It were as easy to imagine a watch evolving itself spontaneously from the raw material which

composes it; to picture a man-of-war arising spontaneously from the piles of wood and stores of iron and brass in a shipyard.

If, then, spontaneous generation is not a chimera, it is something which has far humbler beginnings than has ordinarily been supposed. If it ever took place at all, it must have occurred in some homogeneous chemical compound which was the product of known chemical forces. And if this be true, the time which elapsed from the formation of such a living compound, until its development into the highly organized protoplasm which we now know, must have embraced as many long æons as intervened between the advent of protoplasm and the first appearance of the higher orders of animal and plant life.

The mechanical theory of life, it is thus seen, is far from being borne out by the known facts of science. It assumed the homogeneity of protoplasm; and in this it was in error. It assumes the origin of life by the action on the elements of forces which are resident in matter, and teaches that living

differs from brute matter only in the relative complexity of molecular structure, and of the higher integration of forces which is the natural result of complexity of structure. When such assumption denies, as it usually does deny, the existence of any force outside of matter ; when it makes matter, as such, the sole cause of the countless evolutions which have occurred in the past development of the universe, when it attempts, as does Virchow, to resolve the production of the divers forms of life from inanimate matter into a question of mere mechanics ; when, finally, it not only ignores, but positively denies, the ever present, unceasing action of the Divine administration ; then we can as unhesitatingly pronounce it false, as it is demonstrably so in predicating homogeneity of protoplasm. Under such circumstances it is as difficult for the theist, without assuming the intervention of a miracle, to conceive of the formation of a single chemical compound from its constituent elements, not to speak of the spontaneous origination of living matter, as it was to Darwin to

picture to his mind the production of an elephant by the sudden flashing of certain elemental atoms into living tissues. Given matter, however, and forces competent to transform matter—such forces, as well as the matter which they affect, being always under the guidance of the Divine administration—and there is nothing in the theory of the origination of living from not-living matter, that is contrary either to faith or philosophy. On the contrary, such a view is, as we have seen, quite in harmony with both the one and the other. Under such conditions the spontaneous generation, either in the laboratory of nature or in that of the chemist, presents no greater difficulties than does the conversion of a bar of steel into a magnet. In both cases it is God who is the author of the change, yet God acting not directly, but through the instrumentality of natural agencies; through the “seminal reasons” and the laws of nature which He conferred on matter in the beginning.

CHAPTER VII.

THE SIMIAN ORIGIN OF MAN.

The Missing Link.

ANOTHER question in connection with Evolution which has attracted even greater attention than spontaneous generation, is that respecting the animal origin of man. If it be true that living has evolved from not-living matter; if it be admitted that the higher are genetically related to the lower forms of life, then, we are told, the only logical inference is that man is descended from some form of animal. With the majority of contemporary non-Catholic evolutionists, the conviction of the truth of man's animal origin is so strong, that it is accepted as a fact which no longer admits of doubt. According to their view, all that remains is to trace man's relationship with his dumb predecessor, to discover the "missing link" which

connects him with the beasts of the field, and the controversy is closed forever.

Here again, as in the case of spontaneous generation, we must carefully discriminate between fact and theory; between positive evidence for man's simian genealogy, and the various assumptions which so many evolutionists are ever too ready to ask us to accept.

I can do no better than reproduce here the testimony of one who will not be accused of bias towards Theism; who, far from being opposed to the theory of man's descent from the ape, most strongly favors it, but who insists on having evidence of such connection before giving his assent. I refer to the celebrated anatomist and anthropologist, Dr. Rudolph Virchow, than whom no one is more competent to give an opinion on this much-vexed question.

In an address delivered before the twentieth general meeting of the German Anthropological Association, at Vienna, August, 1889, he gave a review of the progress of anthropology

during the preceding two decades. In the course of his discourse he asserted, what he has more recently affirmed at Moscow and elsewhere, that there is as yet not a scintilla of evidence for the ape-origin of man, and that even the hope of discovering the missing link is something that does not find any warranty in the known facts of anthropology.

“At the time of our coming together twenty years ago,” he says, “Darwinism had just made its first triumphal march through the world. My friend, Carl Vogt, with his usual vigor entered the contest, and through his personal advocacy secured for this theory a great adherence. At that time it was hoped that the theory of descent would conquer, not in the form promulgated by Darwin, but in that advanced by his followers; for we have to deal now not with Darwin but with Darwinians. No one doubted that the proof would be forthcoming, demonstrating that man descended from the monkey and that this descent from a monkey, or at least from some kind of an animal, would soon be established. This was a challenge which was made and successfully defended in the first battle.

Everybody knew all about it and was interested in it. Some spoke for it; others against it. It was considered the greatest question of anthropology.

“Let me remind you, however, at this point, that natural science, so long as it remains such, works only with real, existing objects. A hypothesis may be discussed, but its significance can only be established by producing actual proofs in its favor, either by experiments or direct observations. This, Darwinism has not succeeded in doing. In vain have its adherents sought for connecting links which should connect man with the monkey. Not a single one has been found. The so-called *pro-anthropos*, which is supposed to represent this connecting link, has not as yet appeared. No real scientist claims to have seen him. Hence the *pro-anthropos* is not at present an object of discussion for an anthropologist. Some may be able to see him in their dreams, but when awake they will not be able to say they have met him. Even the hope of a future discovery of this *pro-anthropos* is highly improbable; for we are not living in a dream, or in an ideal world, but in a real one.”

But although there is no tangible evidence of the existence of the missing link, connecting man with the monkey

or with lower forms of life, some people have, nevertheless, to use Virchow's ironical words, "seen him in their dreams." They have seen him in the gorilla and in the orang-outang, in the lemur and in the kangaroo. They have observed him in the Neanderthal man, and in the men of Naulette, Denise, of Canstadt and of Eguisheim. De Mortillet has scrutinized him in the imaginary being that fashioned the flint-flakes of Thenay, Puy-Courny and Portugal. And so sure is he that he has discovered our immediate ancestor, that he has dubbed him with the name, *anthropopithecus*, the man-ape, or the ape-man. Darwin has described him as a hairy pithecoïd animal, arboreal in habits and a denizen of "some warm forest-clad land." According to Cope, man is but "a pentadactylic, plantigrade bunadont," and is genetically connected with the lemuroid, *phenacodus* and the *anaptomorphus homunculus*, both of which flourished in the early Tertiary Period. Hæckel goes further back and discerns in the skull-less, brain-less and member-less amphioxus, an animal which we

should regard with special veneration "as being of our own flesh and blood," and as being the only one of all extant animals which "can enable us to form an approximate conception of our earliest vertebrate ancestors." All these imaginings, however, are, as Virchow truly observes, but dreams, hypotheses more or less extravagant, which have secured for their originators a certain amount of temporary notoriety, but which have no foundation whatsoever in any fact or legitimate induction of science.¹

But if the fact of the animal origin of man has not been established, if there is no likelihood that it will be established, at least in the immediate future, even according to the testimony of those who are most desirous of seeing the pithecoïd ancestry of man demonstrated, what is to be said of the opinions of those who, nevertheless, maintain

¹ In his admirable study, "Apes and Man," St. George Mivart, a pronounced evolutionist, gives, in a few words, the verdict of comparative anatomy respecting the simian origin of man. He says, p. 172: "It is manifest that man, the apes and half-apes, cannot be arranged in a single ascending series of which man is the term and culmination."

the animal origin of man, if not as a fact, at least as a tenable opinion? Is such an opinion compatible with Dogma, and can a consistent Catholic assent to any of the theories now in vogue which claim that man is genetically related to the inferior animals? This is a question which is often put, and one which, far from being treated with derision, as is so often the case, should receive a serious and a deliberate answer.

We have seen that a belief in spontaneous generation, and in the development of the higher forms of animal and plant life from the lower forms, is quite compatible with both revelation and faith; but can this likewise be said of the development of man from a monkey or from any other inferior animal?

The Human Soul.

As to the soul of man we can at once emphatically declare, that it is in nowise evolved from the souls of animals, but is, on the contrary, and in the case of each individual, directly and immediately created by God Himself. I do not say that this is a *Dogma* of faith,

because the question has never been formally defined by the Church. It is, however, Catholic doctrine, and has been taught almost universally from the time of the apostles.¹

Creation of Man's Body.

Man, however, is not a pure spirit, but a creature composed of a rational soul and a corruptible body. The question now arises: Was the body of the first man, the progenitor of our race, created directly and immediately by God, or was it created indirectly and through the operation of secondary causes? When the Bible tells us that "the Lord God formed man from the slime of the earth," are we to interpret these words in a rigorously literal sense, and to believe that the Creator actually fashioned Adam from the slime of the earth, as a potter would fashion an object from clay, or as an artist would produce the model of a statue from wax or plaster? Or, may we put a different interpretation on the

¹ For a fuller account of the views held by certain Fathers and theologians respecting the origin of the human soul, see "Evolution and Dogma," chap. vi.

text and regard man, *quoad corpus*, as indirectly created, as the last and highest term of a long series of evolutions which extend back to the first advent of life upon earth. In other words, is man, as to his body, the direct and special work of the Creator's hands, or is he the descendant of some animal, some anthropoid ape or some "missing link," of which naturalists as yet have discovered no trace?

This is one of the burning questions of science; one which has given to Darwinism most of its notoriety and importance, and one which is inseparably linked with every theory of organic Evolution by whomsoever advocated. We have seen that, as Catholics, we are at liberty to accept the theory of Evolution as to all the multifarious forms of animal and plant life, that it is, indeed, a probable, if not the most probable, theory, and that far from derogating from the wisdom and omnipotence of God, it affords us, on the contrary, a nobler conception of the Deity than does the traditional view of special creation. May we now extend the

Evolution theory so as to embrace the body of man, and allow that it is no exception to the law which, we may admit, has obtained in the Evolution of all other forms of terrestrial life? Or, is there anything in Scripture and in the dogmatic teaching of the Church, that will preclude such a view of the animal part of our first ancestor?

We have already learned that, as a matter of fact, no positive evidence has been adduced in support of the simian origin of man, and that there is little, if any, reason to believe that such evidence will be forthcoming. Since the publication of Darwin's "*Origin of Species*," naturalists have been exploring every portion of the globe for some trace of the missing link between man and the highest known mammal, a link which they said must exist somewhere if the hypothesis of Evolution of man be true. Explorations have been conducted in the dark forests of equatorial Africa, in the dense jungles of southern Asia, in the slightly-frequented islands of every sea, in the caves and lakewellings of Europe, in the mounds and

cliff-dwellings of America, in the gravel beds and stalactitic deposits of the Tertiary and Quaternary Periods, in the tombs and burial places of prehistoric man; but all to no purpose. Men have, indeed, fancied that they had discovered the missing link in the *dryopithecus*, in pygmies of Central Africa, in the Andaman Islanders, in the Ainos of Japan, in the *anthropopithecus erectus*, recently discovered by Dubois in the Pleistocene strata of Java, but if we may judge by those who are most competent to pronounce an opinion in the premises, the long-looked-for link connecting man with the ape is as far away now, and its existence as little probable, as it was thirty years ago, if indeed it is not less probable.

But granting that the search for the link connecting man with the ape has so far been futile; admitting, with Virchow, that "the future discovery of this pro-anthropos is highly improbable;" may we not, nevertheless, believe, as a matter of theory, that there has been such a link, and that, corporally, man is genetically descended

from some unknown species of ape or monkey? Analogy and scientific consistency, we are told, require us to admit that man's bodily frame has been subject to the same law of Evolution, if an Evolution there has been, as has obtained for the inferior animals. There is nothing in biological science that would necessarily exempt man's corporeal structure from the action of this law. Is there, then, anything in Dogma or sound metaphysics, which would make it impossible for us, *salva fide*, to hold a view which has found such favor with the great majority of contemporary evolutionists?

Mivart's Theory.

It was the distinguished biologist and philosopher, St. George Mivart, who first gave a categorical answer to these questions in his interesting little work, "The Genesis of Species," published nearly a quarter of a century ago. He contended that it is not "absolutely necessary to suppose that any action different in kind took place in the production of man's body, from that which took

place in the production of the bodies of other animals, and of the whole material universe." To judge from his subsequent writings, time has but confirmed him in this view, and afforded him opportunities of developing and corroborating his argument.

When Mivart's book first appeared it was severely criticised by the Catholic press, both of the Old and the New World, and its author was in many instances denounced as a downright heretic. Indeed, he was almost as roundly and as generally berated, by a certain class of theologians, as was Charles Darwin after the publication of his "*Origin of Species*." In England, France and Germany the denunciation of the daring biologist was particularly vehement, and strenuous efforts were made to have his work put on the Index. It was almost the universal opinion among theologians that the proposition defended was heretical, and it was considered only a matter of a short time until it would be formally condemned. The book was forwarded to Rome, but, contrary to the expectations of all who were eagerly

watching the course events would take, the book was not condemned. Neither was its author called upon to retract or modify the proposition which had been such an occasion of scandal. Far from censuring the learned scientist, the pope, Pius IX, made him a doctor of philosophy, and the doctor's hat was conferred on him by no less a personage than Cardinal Manning himself.

Since 1871, when Mivart's book was given to the world, a great change of sentiment has been effected among those who were at first so opposed to his opinions, and who imagined they discerned lurking in them not only rank heresy but also bald and unmitigated Materialism. Men have had time to examine dispassionately the suspected propositions, and to compare them with both the formal definitions of the Church and the teachings of the Fathers. The result of unimpassioned investigation and mature reflection has been, not indeed a vindication of the truth of the position of the English scientist, but a feeling that his theory may be tolerated, and that because it deals rather with a

question of science than with one of theology. It has been shown that his propositions do not positively contravene any of the formal definitions of the Church, and that both St. Augustine and the Angelic Doctor, to mention no others, have laid down principles, which may be regarded as reconcilable with the thesis defended with so much ingenuity by the brilliant author of "The Genesis of Species."

Angelic Doctor on Creation of Adam.

The Angelic Doctor, in accord with the traditional teaching of the Fathers, holds that the body of the first man was immediately and directly formed by God himself, but he admits the possibility of angelic intervention in its formation and preparation for the reception of its informing principle, the rational soul. According to this view God created absolutely, *ex nihilo*, the human soul, but delegated to His creatures, the angels, the formation, or at least the formation in part, *aliquod ministerium*, of man's body. It is manifest, however, that if God could have formed the body

of Adam through the agency of angels, He could have communicated the same power to other agencies, if He had so willed. Instead, for instance, of delegating angels to form the body of the common father of mankind, He could, we may believe, have given to matter the power of evolving itself, under the action of the Divine administration, into all the forms of life which we now behold, including the body of man. The product of such an Evolution would not be a rational animal, as man is, but an irrational one; the highest and noblest representative of the brute creation, but, nevertheless, only a brute.

Such an irrational animal, the result of long years of development, and the product of the play, during untold æons, of evolutionary forces on lower forms of life, such a *substratum* it was, according to Mivart's theory, into which the Creator breathed the breath of life and man forthwith "became a living soul." According to this theory, then, God created the soul of man directly, and his body indirectly or by the

operation of secondary causes. In both cases, however, He is really and truly the Creator, and there is nothing in the theory which is in any wise derogatory to His power or wisdom. We simply admit for the body of man what we have seen may readily be admitted for the rest of the animal world—creation through the agency of secondary causes, instead of direct and immediate creation without the concurrence of any of God's creatures.

This view of the derivative origin of Adam's body, is also quite in harmony with other principles laid down both by the great Bishop of Hippo and the Angel of the Schools. For they both taught, that in the beginning God created, in the absolute and primary sense of creation, only corporeal elements and spiritual substances. Plants, animals and even man, did not exist as we know them—*in natura propria*; but only potentially, receiving their full development afterwards—*per volumina sæculorum*. They existed only in what the saint calls seminal reasons—*in rationibus seminalibus*; and the

production of the manifold forms of life, man included, which now adorn our planet, was the work of Evolution, viz., secondary causes acting under the continued and uninterrupted guidance of the Divine administration.

From what precedes, it is evinced that the Evolution of the body of man, according to Mivart's view, and the subsequent infusion into this body, by God, of a rational soul, is not necessarily antagonistic to the teachings of St. Thomas. The theory may, indeed, encounter certain grave difficulties in the domains of metaphysics and Biblical exegesis, but I do not think it can absolutely be asserted that such difficulties are insuperable.

At all events, whatever one may be disposed to think of the theory, it is well always to bear in mind that it has never been condemned by the Church, although it has been publicly discussed and defended for full five-and-twenty years. If it were as dangerous as some have imagined, and, still more, if it were heretical, as others have thought, it is most probable that the "Genesis

of Species" would have been put on the Index long ago.

Views of Cardinal Gonzales.

The late Cardinal Gonzales, that profound Thomist and man of science, whose untimely death the Catholic world will mourn for a long time to come, who has treated so luminously the question of Evolution from the point of view of Scripture, patristic theology and scholastic philosophy, has suggested a modification of Mivart's theory, which, he thinks, would make it more acceptable to theologians than it is as it now stands. If, he says, without however committing himself to the opinion expressed—if, instead of affirming, as the English biologist does, that the body of Adam was nothing more than a fully-developed ape, into which God infused a rational soul, we admit that the body of the first man was *partly* the product of Evolution from some lower animal form, and partly the direct work of God Himself, we may thereby, he opines eliminate many of the objections urged against the theory as formulated by its

author. According to this modified view, the body of man was developed from the inferior forms of life only until a certain point, but in this condition it was not prepared to be endowed by an intelligent soul. This imperfect body, however, this unfinished product of evolutionary forces, is taken in hand by the Almighty, who perfects what was begun, gives it the finishing touches, as it were, and renders it a fit habitation, which it was not previously, for a soul which was to be made to His own image and likeness, a soul which was to be dowered with the noble attributes of reason, liberty and immortality.

Speaking for myself, I must confess that such a modification appears unnecessary, and, in the light of the teachings of St. Augustine and St. Thomas, it seems that one may as readily accept the theory as proposed by Mivart, as the restricted form of it which the distinguished cardinal suggests. If we are to admit the action of Evolution at all, in the production of Adam's body, it appears more consistent to admit that it was competent to complete the work

which it began, than to be forced to acknowledge that it was obliged to leave off its task when only partially completed. For, whether we assert that the body of the first man was entirely, or only partially, the result of evolutionary action, it was, in both cases, according to the principles we have adopted, the work, and ultimately the sole work, of Almighty God. According to Mivart's view, the body of Adam was formed by God solely through the agency of secondary causes; according to Gonzales it was formed by God partly through the concurrence of secondary causes, and partly by His direct and immediate action. If we are to admit that Evolution had anything whatever to do with man's corporeal frame, it seems more logical to admit that it finished the work which it began, always, of course, under the guidance of the Divine administration, than to suppose that God gave to His secondary agents a work which they might commence, indeed, but which, by reason of limitations imposed on them, they were unable to complete.

One cannot help thinking, when one seriously reflects on the matter, that the learned cardinal—and what is said of him may be predicated of creationists generally — unconsciously favors the very notion he wishes to oppose. He wishes, above all things, to safeguard the creative act, and bring out in bold relief the Divine attributes of wisdom and omnipotence, but he unwittingly, it would seem, makes greater demands than his case requires. Indeed, it strikes me that those who hold the special creation theory as to the body of the father of our race, and the same may be said of believers in the special creation of the forms of life below man, constitute themselves defenders of the very theory which the great St. Athanasius, full fifteen centuries ago, felt called upon to criticise adversely. Arguing against the anthropomorphic views which the heathen entertained of the Almighty, he contended that the God of the Christians is a Creator, not a carpenter—*κτίστης οὐ τεχνίτης*. In accord with the illustrious Alexandrian Doctor's view, it has been truthfully observed that: "The Great Architect

theory in theology is the analogue of the *emboitement* theory in science. Both were invented when mechanism dominated thought, and we have outgrown both."

In commenting on Mivart's theory, the erudite Cardinal Archbishop of Seville manifests his characteristic liberality and breadth of view, strikingly resembling in this respect his immortal master, the Angel of the School :

"As the question stands at present," he says, "we have no right to reprobate or reject, as contrary to Christian faith, or as contrary to revealed truth, the hypothesis of Mivart; the hypothesis, namely, which admits the possibility that the body of the first man, the organism which received the rational soul created by God, and infused into Adam, was a body which received an organization suitable for the reception of the human soul, not directly and immediately from the hand of God, but in virtue of the action of other antecedent animated beings, more or less perfect and similar to man in bodily structure."

Elsewhere he declares :

"I should not permit myself to censure the opinion of the English theologian so long as it is respected, or at

least tolerated, by the Church, the sole judge competent to fix and qualify theologico-dogmatic propositions, and decide regarding their compatibility or incompatibility with Holy Scripture."

From the foregoing it is evident, that whatever may be the final proved verdict of science in respect of man's body, it cannot be at variance with Catholic Dogma. Granting that future researches in paleontology, anthropology and biology, shall demonstrate beyond doubt that man is genetically related to the inferior animals, and we have seen how far scientists are from such a demonstration, there will not be, even in such an improbable event, the slightest ground for imagining that then, at last, the conclusions of science are hopelessly at variance with the declarations of the sacred text, or the authorized teachings of the Church of Christ. All that would logically follow from the demonstration of the animal origin of man, would be a modification of the traditional view regarding the origin of the body of our first ancestor. We should be obliged to revise the

interpretation that has usually been given to the words of Scripture which refer to the formation of Adam's body, and read these words in the sense which Evolution demands, a sense which, as we have seen, may be attributed to the words of the inspired record, without either distorting the meaning of terms or in any way doing violence to the text.

Interpretation Not Revelation.

In the consideration of questions like the present, we must never, be it remembered, lose sight of the fact that interpretation is not revelation ; neither is revelation interpretation. Superficial readers are but too frequently misled into believing, that the declarations of the Bible must necessarily bear the meaning which commentators have fancied they should have, when, as a matter of fact, the real sense is often entirely different, if not, indeed, quite the contrary. The opinions of men may change, and are, of a truth, perpetually changing, but the declarations of the Holy Spirit are ever infallible and immutable. We can never too carefully

discriminate between the truth of God's revelation to His creatures, and the truth of our apprehension of His revelation. In the beginning we may have but occasional glimpses and faint adumbrations of the truth, and it often happens that we come into possession of the whole truth, in all its significance and beauty and grandeur, only after the lapse of long ages of persistent effort and tireless investigation. Hence the anthropomorphic and anthropocentric views entertained by the early interpreters of Scripture respecting divers questions pertaining to the Deity, and the creatures which are the work of His omnipotence. Time and reflection and research show that such views are ill-founded, and substitute in their place a nobler conception of the Creator, and one that is, at the same time, more in accordance with the teachings of nature and the spirit of Divine revelation.

It is possible, although highly improbable, that the evolutionary theory of the origin of Adam's corporeal frame is one of such cases. And it is possible,

too, that our successors in the enjoyment of light that is not vouchsafed to ourselves, may be willing to admit as a scientific doctrine, what we, at present, are not justified in considering as more than a fanciful and unwarranted hypothesis. Nevertheless, be this as it may, we must not forget what has already been adverted to when discussing the derivative origin of animals and plants, viz., that Evolution is not a theory of creation or cause, but one of order and method; a *modus creandi* which the Deity was pleased to adopt. Of the origin of matter, of life, of spirit, science, as such, can give us no information. As to the origin of matter, Evolution, as a doctrine, is confessedly mute.

“Of the origin of life it does not profess to have the slightest knowledge; of the character of the in-dwelling force, which out of the one original cell develops the marvelous diversity of architecture in the individual beings, of the variations which gave a start to the process of natural selection in the differentiation of species, it can tell us nothing; of the marvelous adaptation of the

external conditions of the inorganic world to the growth and differentiation of organic life, it gives no account; the unity of all this infinite variety of development in one great order, having a continual progress towards a higher perfection, it sees clearly, but it cannot find a cause. No wonder that, as we have seen, those who study it most deeply and philosophically are driven to go behind it in the search after a true cause. . . . For clearly the development under fixed laws and gradual process of the organic world, no more prevents the original creative and directive Idea from being the true cause of all, than the passing of the individual being through all stages of embryonic existence from the simple cell, makes it less the creature of the Supreme Hand. That the archetypal idea of the Creative Mind may fulfill itself equally, whether it act directly or through intermediate gradations, we can see clearly not only by abstract theory but by experience of our own 'creations.' "1

1"Some Lights of Science on the Faith," by Alfred Barry, D.D., D.C.L., pp. 111 and 112.

CHAPTER VIII.

TELEOLOGY, OLD AND NEW.

The Doctrine of Final Causes.

FROM what precedes it is evident, that the most that Evolution can do is to substitute derivative for special creation, a substitution which, as we have learned, can be admitted without any derogation whatever to either faith or Dogma. But there is yet another objection against Evolution, which, by some minds, is regarded as more serious than any of the difficulties, heretofore considered, of either philosophy or theology. This objection, briefly stated, is that Evolution destroys entirely the argument from design in nature, and abolishes teleology, or the doctrine of final causes. In the case of Darwin, for instance, as we learn from his "Life and Letters," he had no difficulty in

accepting derivative in lieu of special creation, but when it came to reconciling natural selection and Evolution with teleology as taught by Paley, he felt that his chief argument for believing in God had been wrested from him entirely.

So persuaded, indeed, have many naturalists and philosophers been, if we are to believe their own words, that Darwinism and Evolution have given the deathblow to teleology, that they forthwith dismiss all arguments based on design and final causes as utterly worthless. And, of those who are not in sympathy with Christianity, we find not a few who are unable to conceal their exultation over what they regard as the inglorious and complete discomfiture of the theologians. Thus Hæckel, in his "*History of Creation*," writes:

"I maintain with regard to the much-talked-of 'purpose in nature,' that it really has no existence but for those persons who observe phenomena in animals and plants in the most superficial manner."

Büchner boasts:

"Modern investigation and natural philosophy have shaken themselves toler-

ably free from these empty and superficial conceptions of design and leave such childish views to those who are incapable of liberating themselves from such anthropomorphic ideas, which unfortunately still obtain in school and church to the detriment of truth and science."

It were easy to multiply similar quotations, but the two just given are quite sufficient for our present purpose. Judging from their public utterances, as well as from their well-known private opinions, there is no mistaking the animus of these soi-disant exponents of modern thought. If we are to take them at their own words, they seem to be as eager, if not more eager, for the extirpation of Dogma and all forms of religious belief, as they are for the advancement of what they denominate "science."

A Newer Teleology.

It would be a grave mistake, however, to think that Hæckel and Büchner truthfully reflect the opinions of scientists generally, or that the large body of naturalists are at one with them in proclaiming that the argument from design

in nature is no longer tenable, or that Evolution and teleology are wholly incompatible. So far, indeed, is this from being the case, that the most philosophical of contemporary naturalists, those who are most competent to interpret the facts and phenomena of nature and to draw legitimate conclusions from the facts observed, are almost unanimous in declaring that the teleological argument, not only is not weakened, much less destroyed, but that it is, on the contrary, illustrated and corroborated in the most remarkable and unexpected manner. And strange as it may appear, the very one who, according to Hæckel, Büchner, Vogt, G. H. Lewes and others whose anti-theological animus is so marked as to require no comment, was supposed to have banished forever from science and theology, not only design and purpose but all final causes whatsoever, is the very one who, above all others, has put teleology on a firmer and a nobler basis than it ever occupied before. We have no longer, it is true, the argument as it was presented by Paley, and developed by Chalmers and

the authors of the Bridgewater Treatises, but we have in its stead one that is grander, more comprehensive, more effective and more conclusive.

Professor Asa Gray, admittedly one of the ablest botanists of the century, and to the day of his death a strenuous and consistent advocate of the theory of Evolution, thus expresses himself when speaking of the work of Charles Darwin:

“Let us recognize Darwin’s great service to natural science in bringing back to it teleology ; so that instead of morphology *versus* teleology, we shall have morphology wedded to teleology.”

In another place he speaks of “the great gain to science from his [Darwin’s] having brought back teleology to natural history. In Darwinism, usefulness and purpose come to the front again as working principles of the first order ; upon them, indeed, the whole system rests.”

“In this system,” he continues, “the forms and species in all their variety are not mere ends in themselves, but the whole a series of means and ends, in the contemplation of which we may obtain higher and more

comprehensive, and perhaps worthier, as well as more consistent views, of design in nature, than heretofore."

In it we have "a theory that accords with, if it does not explain, the principal facts, and a teleology that is free from the common objections," for, "the most puzzling things of all to the old school teleologists are the *principia* of the Darwinian."

Evolution and Teleology.

In the "Life and Letters of Charles Darwin," edited by his son, we read :

"One of the greatest services rendered by my father to the study of natural history is the revival of teleology. The evolutionist studies the purpose or meaning of organs with the zeal of the older teleology, but with far wider and more coherent purpose. He has the invigorating knowledge that he is gaining, not isolated conceptions of the economy of the present, but a coherent view of both past and present. And even where he fails to discover the use of any part, he may, by a knowledge of its structure, unravel the history of the past vicissitudes in the life of the species. In this way a vigor and unity is given

to the study of the forms of organized beings, which before it lacked."

Prof. Huxley, who loves to pose as an agnostic, but who is endowed with a critical acumen that is possessed by neither Büchner nor Hæckel, affirms that:

"The most remarkable service to the philosophy of biology rendered by Mr. Darwin, is the reconciliation of teleology and morphology, and the explanation of the facts of both, which his views offer. The teleology which supposes that the eye, such as we see it in man or one of the higher vertebrates, was made with the precise structure it exhibits, for the purpose of enabling the animal which possesses it to see, has undoubtedly received its death-blow. Nevertheless, it is necessary to remember that there is a wider teleology which is not touched by the doctrine of Evolution, but is actually based upon the fundamental principle of Evolution."

To the foregoing testimonies, and others of like import which could easily be adduced in any number desired, I will add the matured opinion of the distinguished naturalist and keen metaphysician, whose name has already figured so frequently in these pages,

St. George Mivart. A biologist of marked eminence, an evolutionist of pronounced convictions, a theologian of recognized ability, no one is better qualified to express a judgment regarding the bearings of the Evolution theory on the argument from design and the doctrine of final causes.

"A careful study," he tells us, "of the inter-relation and inter-dependencies which exist between the various orders of creatures inhabiting this planet, shows us a yet more noteworthy teleology—the existence of whole orders of such creatures being directed to the service of other orders, in various degrees of subordination and augmentation, respectively. This study reveals to us, as a fact, the enchainment of all the various orders of creatures in a hierarchy of activities, in harmony with what we might expect to find in a world, the outcome of a First Cause possessed of intelligence and will, since it exhibits, at the same time, both 'continuity' and 'purpose.' It shows us, indeed, that a successively increasing fulfillment of 'purpose' runs through the irrational creation up to man. And thus the study of final causes reveals to us how great is our dignity, and, consequently, our responsibility."

Design and Purpose in Nature.

The quotations just made from some of the most eminent and most philosophical of modern naturalists—and they are in perfect accord with the sentiments of the great majority of contemporary evolutionists—prove that true votaries of science, far from denying design and purpose in nature, affirm, on the contrary, their existence, and profess themselves unable to account for the facts and phenomena of the visible universe without postulating a First Cause, the Creator and Ordainer of all the beauty and harmony we so much admire, both in organic and in inorganic nature. From these quotations, too, we see how erroneously the teachings of true science are interpreted by a blatant and anti-religious minority, and what a grievous injustice is done to the real representatives of science, by those whose chief object seems to be to foment discord between science and religion, and to intensify an *odium theologicum* on one hand, and provoke an *odium scientificum* on the other, which

are both as silly as they are unwarranted. In spite of all that may be said to the contrary, the unbiased and reverent student must see in nature the evidence of a Power which is originaive, directive, immanent; a Power which is intelligent, wise, supreme. And, notwithstanding the asseverations of the noisy and supercilious few, who are notorious rather for their fanciful theories than prominent for genuine contributions to science, no serious investigator can fail to discern, in the world of beauty and usefulness with which we are surrounded, the most conclusive evidence that what we denominate the laws of nature must have existed in idea before they existed in fact; must have existed in the mind of a supreme, creative Intelligence, as the realities which we now observe and coördinate.¹ Evolution, therefore, far from weakening the argument from design, strengthens

¹ Paley, in referring to those who speak of law as if it were a cause, very pertinently remarks: "It is a perversion of language to assign any law as the efficient, operative cause of anything. A law presupposes an agent, for it is only the mode according to which the agent proceeds; it implies a power, for it is the order according to which that

and ennobles it; and far from banishing teleology from science and theology, illustrates and corroborates it in the most admirable manner. And despite all attempts to connect teleology with Pantheism or Materialism, or to make Evolution subserve the cause of Atheism or Agnosticism, the result has been that we have now a higher, a subtler, a more comprehensive teleology than the world has ever before known. We have a teleology which is indissolubly linked with the teachings of revealed truth; a teleology which, while receiving light from Evolution, illumines, in turn, this grand generalization, and shows us that Evolution when properly understood, is a noble witness to a God who, unlike the God of the older Deism, that "simply sets the machine of the universe in motion, and leaves it to work by itself," is, on the contrary, One who, in the language of Holy Scripture, is not only "above all, but through all, and in all."

power acts. Without this agent, without this power, which are both distinct from itself, *the law* does nothing, is nothing." "Natural Theology," p. 12.

CHAPTER IX.

RETROSPECT, REFLECTIONS AND CONCLUSION.

Evolution Not a New Theory.

WE may now, before concluding, take a survey of the ground over which we have traveled and make a few reflections which are naturally suggested by the discussions which precede.

First of all, then, the evolutionary idea is not, as we have learned, the late development it is sometimes imagined to be. On the contrary, it is an idea that had its origin in the speculations of the earliest philosophers, and an idea which has been slowly developed by the studies and observations of twenty-five centuries of earnest seekers after truth.

In reading over the history of Greek philosophy, we are often surprised to see how the sages of old Hellas anticipated many of the views which are nowadays

so frequently considered as the result of nineteenth century research. With limited means for penetrating the arcana of Nature, they frequently accomplished what we should deem impossible without the aid of microscope and telescope. They are often reproached with being simple, *a priori* reasoners, fanciful speculators and fortunate guessers at the truth; but they were far more than this. They did not, it is true, have at hand the wonderful instruments of precision which we now possess, but they had a keenness of perception and a faculty for getting at the heart of things, which probably have never been equaled and certainly never surpassed. At times, indeed, their intuition amounted almost to divination, and instead of being simple votaries of science, the philosophers of those days were rather its prophets.¹

No; it is a mistake to suppose that the theory of Evolution, whether cosmic or organic, is something new and the

¹ For a more exhaustive account of the contributions of Greek philosophy to the theory of Evolution see "Evolution and Dogma," Part I.

product solely of modern research. It is something old, as old as speculative thought, and stripped of all explanations and subsidiary adjuncts, it is now essentially what it was in the days of Aristotle, St. Augustine, and the Angel of the Schools. Modern research has developed and illustrated the theory, has given it a more definite shape and rendered it more probable, if indeed it has not demonstrated its truth, but the central idea remains practically the same as it was when "the master of those that know—*il maestro di color che sanno*," as Dante calls Aristotle—indited his works on "Physics," and the "History of Animals," and when the great Bishop of Hippo penned his wondrous treatises on "Genesis" and "The Trinity." Indeed, we can say of Evolution what Lord Bacon said of natural science in the beginning of the seventeenth century:

"If," says he, "the natural history extant, though apparently of great bulk and variety, were to be carefully weeded of its fables, antiquities, quotations, frivolous disputes, philosophy, ornaments, it would shrink to a slender bulk."

Similarly might we affirm, and with equal truth, if Evolution were to be separated from all the theories and fantastical speculations which in the minds of many are an essential part of it, very little, at least as to its principles, would remain, which was unknown to Aristotle, Gregory of Nyssa, Augustine and Thomas Aquinas.

Darwinism Not Evolution.

Darwinism, as has already been remarked, is not Evolution; neither is Lamarckism nor Neo-Lamarckism. The theories which go by these names, as well as sundry others, are but tentative explanations of the methods by which Evolution has acted, and of the processes which have obtained in the growth and development of the organic world. They may be true or false, although all of them undoubtedly contain at least an element of truth, but whether true or false, the great central conception of Evolution remains unaffected. Whether natural selection has been the chief agent in the Evolution of plants and animals, as Darwin

and Wallace contend, or whether the influence of activity and environment has been a more potent factor, as Lamarck and Cope maintain, is as yet uncertain. But be this as it may, it matters not. It is still far from certain that we have discovered the leading factor or factors of Evolution. All theories so far advanced to account for the phenomena of change and development, are at best but guesses and provisional hypotheses; and no serious man of science claims that they are anything more. They have unquestionably contributed much towards the advancement of the science of biology, and have enabled naturalists to group together facts which were formerly considered as disparate and irreconcilable. They have suggested explanations of phenomena that were shrouded in mystery, and enabled us to perceive in nature a unity of plan and purpose, which, without such theories, would either be obscured or entirely elude our view.

Much, undoubtedly, remains yet to be done, but no one who is familiar with the history of science in the past

half century, can deny that marvels have been accomplished during this time, and that a flood of light has been thrown on some of the most puzzling problems of natural science. Whatever value, then, we may attach to the theories of Lamarck and Saint-Hilaire, of Darwin and Wallace and Mivart, no one can deny that they are entitled to a lasting debt of gratitude for their brilliant researches, and for their untiring zeal and signal success in collecting and coördinating facts in a way that has never before been accomplished. Whether their theories be all that has been claimed for them or not, they have certainly popularized an idea which prior to their promulgation interested but a few, and given to the study of science an impetus which it had never before experienced. They have given to the evolutionary idea a relief, and endowed it with a fascination, which have captivated the world. They have inspired among the masses a love of nature which did not previously exist, and have stimulated investigation and spurred on progress in a manner to win

the admiration and extort the plaudits of the most indifferent and phlegmatic. As to the authors of these theories, they have ushered in a new era, and are the kings and prophets of the most active and most prolific period of research that the world has yet witnessed. Others will come after them who will correct their errors and improve on their theories, but the triumphs of these pioneers of the renaissance of science will endure with undiminished lustre as long as there shall remain an annalist to record the achievements of human progress.

Evolution in the Future.

What shall ultimately be the fate of the arguments now so confidently advanced in favor of Evolution by its friends, and against it by its enemies, only the future can decide. The grounds of defense and attack will, no doubt, witness many and important changes. Future research and discovery will reveal the weakness of arguments that are now considered unassailable,

and expose the fallacies of others which, as at present viewed, are thoroughly logical. But new reasons in favor of Evolution will be forthcoming in proportion as the older ones shall be modified or shown to be untenable. And, as the evolutionary idea shall be more studied and developed, the objections which are now urged against it, will, I doubt not, disappear or lose much of their cogency. New theories will be promulgated, new explanations of present difficulties will be suggested, and a clearer knowledge will be vouchsafed of what are the real, if not the chief factors, of the vast evolutionary processes which are at the bottom of all forms of organic development. As in physics so also in biology; continued investigation of facts and phenomena is sure to issue in a clearer and truer view of nature, and of the agencies which have been instrumental in bringing animated nature from its primordial to its present condition. And every new discovery, every new fact brought to light and correlated with facts already known, will mean a step forward; will

betoken progress, knowledge and enlightenment.

Evolution Not Antagonistic to Religion.

Yet more. In proportion as Evolution shall be placed on a solider foundation, and the objections which are now urged against it shall disappear, so also will it be evinced, that far from being an enemy of religion, it is, on the contrary, its strongest and most naturally. Even those who have no sympathy with the traditional forms of belief, who are, in principle, if not personally, opposed to the Church and her dogmas, perceive that there is no necessary antagonism between Evolution and faith, between the conclusions of science and the declarations of revelation. Indeed, so avowed an opponent of Church and Dogma as Huxley informs us that:

“The doctrine of Evolution does not even come into contact with Theism, considered as a philosophical doctrine. That with which it does collide, and with which it is absolutely inconsistent, is the conception of creation which theological speculators have based upon

the history narrated in the opening book of Genesis."

In other words, Evolution is not opposed to revelation, but to certain interpretations of revelation. It is not opposed to the dogmas of the Church, but to the opinions of certain individual exponents of Dogma, who would have us believe that their views of the Inspired Record are the veritable expressions of Divine truth.

To say that Evolution is agnostic or atheistic in tendency, if not in fact, is to betray a lamentable ignorance of what it actually teaches, and to display a singular incapacity for comprehending the relation of a scientific induction to a philosophical—or, more truthfully, an anti-philosophical—system. The simple assertion of Hæckel and his school, that Evolution implies the monistic or mechanical theory of the universe, proves nothing, for assertion is not proof. Rather should it be affirmed that Evolution, in so far as it is true, makes for religion and Dogma; because it must needs be that a true theory of the origin and development of things

must, when properly understood and applied, both strengthen and illustrate the teachings of faith.

Evolution does, indeed, to employ the words of Carlyle, destroy the conception of "an absentee God, sitting idle, ever since the first Sabbath, at the outside of His universe and seeing it go." But it compels us to recognize that "this fair universe, were it in the meanest province thereof, is, in very deed, the star-domed city of God; that through every star, through every grass-blade, and most, through every living soul, the glory of a present God still beams."

Objections Against New Theories.

It is true, indeed, as we have already learned, that Evolution has been decried, even by men of marked ability, as leading to Atheism or Materialism. But similar charges have also been made against other theories and generalizations which are now universally acknowledged as true.

Anaxagoras, it will be remembered, was condemned as a heretic for asserting that the sun, the great god Helios,

was but a mass of molten matter. Spectroscopy has vindicated him, and shown that his accusers were in error. Aristarchus was accused of impiety for having taught that the earth revolves round the sun, and for having anticipated a theory independently discovered and developed eighteen centuries later by Copernicus. The Samian astronomer was charged with having "disturbed the repose of Vesta," and the worshippers of the offended goddess accordingly suppressed or destroyed his sacrilegious works.

Newton's great laws of universal gravitation, when first promulgated, were looked upon with suspicion, and, in some instances, denounced as atheistic. Even so great a mathematician and philosopher as Leibnitz, did not hesitate to condemn Newton's grand discovery, "not only as physically false, but as injurious to the interests of religion."

All are familiar with the absurd objections urged against the heliocentric theory as advocated by Galileo. Lord Bacon rejected it with contempt, and even the distinguished astronomer, Ty-

cho Brahe, notwithstanding all the evidence offered in favor of the Copernican system, invented one of his own which was but a modification of Ptolemy's and no less complex and cumbersome.

Galileo and the Copernican Theory.

It is often said, even by those who should be better informed, that the greatest obstacle in the way of the general acceptance of the Copernican theory was the Church, and that the cause of all of Galileo's woes was the ignorant officials of the Inquisition. The fact is, however, that it was not churchmen, as such, who were opposed to the views which Galileo so ardently and so successfully championed. It was rather the old peripatetic system of philosophy, which, after dominating the world of thought for two thousand years, saw itself finally face to face with what, it was felt on all sides, was destined to prove the most formidable adversary it had yet encountered. For the Ptolemaic system was so closely bound up with the philosophy of Aristotle, and this in turn was so intimately connected with

theology, especially since the time of St. Thomas Aquinas, that any attack on the geocentric system was at once regarded as an onslaught on both philosophy and theology. So great, indeed, was the authority of the "Master," as Aristotle was called, and so long had his *dicta* been accepted without question, that in the minds of many it was almost as impious to assail his opinions as it was to attack the dogmas of faith.

One of the fundamental teachings of the Stagirite was, for instance, that concerning the incorruptibility and immutability of the heavens. Galileo's telescopic discoveries showed that this opinion was not based on fact. He proved that "the heavens can change and lay aside their former aspects, and assume others entirely new;" and in doing this, he gave a death blow to one of the leading tenets on which peripatetics generally had so long set such store. Learned professors at Pisa, Padua and Bologna, tried to silence the illustrious Florentine by the profuse use of syllogisms and to disprove the truth of his observations by *a priori*

reasonings. He was declared by others to be the victim of strange optical illusions, and, accordingly, it was asserted that the spots on the sun, and the satellites of Jupiter and the variable stars had no existence outside of the observer's diseased imagination. Aristotelians indignantly denied the existence of sun-spots, because, said they: "It is impossible that the eye of the universe could suffer from ophthalmia." For an equally trivial reason they rejected Kepler's great discovery of the accelerated and retarded motions of the planets in different parts of their orbits. "It is undignified," they declared, "for heavenly bodies to hurry and slacken their pace in accordance with the law of the German astronomer." Aristotelianism, it was almost universally agreed, was to be safeguarded at all hazards, and Galileo, Kepler and other innovators, who thus ruthlessly trampled under foot the philosophy of the master—" *Si calpesta tutta la filosofia d'Aristotele*"—were to be vanquished at whatever cost, for if they were allowed to continue their sacrilegious

work, they would eventually undermine, not only philosophy and theology, but also sacred Scripture as well.

A quotation from one Sizzi, a learned astronomical authority of the time, will serve to exhibit the puerile character of some of the reasons adduced in favor of the old system and against the new. Galileo having, by the aid of his telescope, discovered the satellites of Jupiter, Sizzi argued against the existence of such bodies as follows :

“There are seven windows given to animals in the domicile of the head, through which the air is admitted to the tabernacle of the body, viz., two nostrils, two eyes, two ears and one mouth. So, in the heavens, as in a macrocosm, or great world, there are two favorable stars, Jupiter and Venus ; two unpropitious, Mars and Saturn ; two luminaries, the sun and moon, and Mercury alone undecided and indifferent. From these and many other phenomena of nature, which it were tedious to enumerate, we gather that the number of planets is necessarily seven. Moreover, the satellites are invisible to the naked eye, and therefore, can exercise no influence over the earth, and would, of course, be useless ; and therefore do not exist.”

Such things appear to us childish and absurd in the extreme; but after all they are but a fair sample of the reasons which were offered by many of the astronomers and philosophers of the time, against the innovations and scientific heresies of Copernicus and Galileo. When one calls to mind what extravagant errors have been defended in the name of Aristotelian philosophy, and what untold mischief *a priori* reasoning has effected in the domain of experimental science; when we understand the temper of mind of those who taught and speculated three centuries ago, we need not be surprised at the many strange things they said and did. We see in their opinions and conduct but a reflex of what is always observed in the progress of knowledge and in the dissipation of ignorance. The much talked-of warfare between science and religion is something that does not exist. The warfare is between truth and error, between science and theory. In Galileo's case, as we have seen, it was Copernicanism *versus* Aristotelianism; *a priori* reasoning against observation and experi-

ment; the syllogism against the telescope.

Conservatism in Science.

And more than this. The same objections that were brought against Galileo and heliocentrism, were urged against Laplace and the nebular hypothesis; against Joule, Mayer, Faraday, Liebig, Carpenter and Helmholtz, on account of their demonstrations of the grand doctrine of the conservation and correlation of the various physical forces. The truth is, men are loath to give up a pet theory, especially when they are once committed to it, and when the shadow of a great name gives to it an air of certainty, if not of infallibility. As a result of this tenaciousness of opinion, and of a conservatism which was far more marked formerly than it is at present, truth advances slowly and science is obliged to contest every step forward. For this reason the enemy of science has not been religion, as is so often declared, but science itself, or what for the time was accepted as science. In like manner those who impeded the advance of science were not

the representatives of the Church, as such, but the advocates of some theory or the adherents of some school or system of thought. For generally, if not always, those who are accused of opposing the advancement of science, and who may actually be in error in matters scientific, are as zealously laboring, so far as their lights go, in the interests of science, as those who have the truth on their side. The enemies of Galileo, for instance, imagined that they were doing the greatest possible service to science in battling as they did for Peripateticism and Ptolemaism. But if they had had before them the same evidences of the truth which we at present possess, they would have made no hesitation in acknowledging their mistakes, or rather, they would never have fallen into the errors for which they are now condemned.

Conflict of Opinions Beneficial.

In the long run, however, the conflict of opinions in questions of science, far from having a pernicious, has a beneficial influence on the advancement of knowledge. It stimulates investigation

and discovery, and serves to place the truth in such a light as no longer to admit of contradiction.

The long-fought battle on the subject of spontaneous generation is a case in point. Pasteur and Van Beneden have proven by their epoch-making researches, that so far as experiment can give any information on the subject, abiogenesis is a chimera. But while we cheerfully accord to these great savants all the encomiums to which they are entitled, we should not withhold from their great antagonists, Pouchet and Bastian, the meed of praise which their researches have earned for them. The latter were mistaken in their views, it is true; they were vanquished in the controversy which they carried on so ably; but, by the very force and originality of their objections, they contributed materially, though indeed indirectly, towards putting the truth in a bolder relief than it would otherwise have received. Had not Pasteur met with the contradictions he did, had he not been obliged to confute objections of all kinds, objections presented in the name

of chemistry, objections urged in the name of biology, objections advanced in the name of metaphysics, he would undoubtedly have discontinued his investigations much sooner than he did, and would have rested satisfied with his earlier and simpler proofs of the untenableness of spontaneous generation.

All glory, therefore, to Galileo and Pasteur for their brilliant achievements! But while sounding the praises of the victors, let us not forget the honors due to those who battled long and gallantly only to suffer defeat in the end. By the very persistence and stubbornness of their contest, they enhanced not only the splendor of the results obtained by their conquerors, but they also labored effectually, albeit indirectly, for the attainment of the same object which was had in view by their antagonists—the truth, the advancement of science and the placing of it on a surer and firmer foundation.

Evolution and Creationism.

Will it not be the same in the still greater and longer contest between

creationism, in the sense of special creationism, and evolutionism? From what precedes it appears almost certain that our reply must be in the affirmative. And when the smoke of battle shall have cleared away; when all animosity shall have been extinguished, and men shall have a concern only for the truth, and not for certain individual opinions; when they shall be more disposed to conserve the interests of genuine science than those of mere hypothesis; then will it be evident to the world that both victors and vanquished were making for the same objective point, all according to their lights, and that the very earnestness and perseverance with which those in the wrong led a forlorn hope, but contributed in the end towards making the truth more conspicuous and towards rendering the stronghold of science more impregnable. Then, too, it will be manifest, that although truth was on the side championed by Aristotle, Sts. Athanasius, Gregory of Nyssa, Augustine, and Thomas Aquinas, by Buffon, Geoffroy Saint-Hilaire, Lamarck, Spencer, Darwin, Huxley, Mivart

and their compeers, nevertheless the opponents of the evolutionary idea, the Fathers and Schoolmen who favored the doctrine of special creation, the Linnæuses, the Cuviers and the Agassiz's, who resolutely and consistently combated Evolution to the last, were all along but helping on and corroborating what they were intent on weakening and destroying. In this case, as in so many others, history but repeats itself and demonstrates again, that opposition may be a source of strength, and contradiction the most effective means of securing certitude and light. For we must bear in mind that it is not mistaken theory that retards the progress of science, but rather erroneous observations. All working scientists are aware, often to their cost, that it is inaccurate or mistaken observations which lead men astray, while erroneous theories have often a most stimulating effect. They suggest and provoke new and more exact observations, and thus lead up to true theories and ultimately to a true knowledge of nature.

Errors in the Infancy of Science.

It is indeed a difficult matter for those who live in the closing years of the nineteenth century, duly to appreciate the mental attitude of those who lived and taught a thousand or two thousand years ago. It is difficult even for us to account for the extravagant views held by distinguished scientists of comparatively recent times, by such men, for example, as Kepler, Stahl, Kircher, Buckland and others of their contemporaries. We smile at the fantastic notions which they entertained respecting some of the most ordinary phenomena of astronomy, chemistry, biology and geology. But we forget that we are living in the full effulgence of inductive science, and that we have the benefit of the labors of thousands and tens of thousands of investigators in every department of thought. We forget that Kepler and Kircher and their collaborators lived in the infancy of science; that they had to blaze the way for their successors, and that, notwithstanding their best efforts to arrive at

the truth, error was inevitable. Ignorant of countless facts now known to every schoolboy, and unacquainted with the theories and laws which are now the common possession of all who read and think, it was but natural that they should have had recourse to explanations and hypotheses which we should at present regard as fanciful and absurd.

Thus, Kepler taught that the heavenly bodies were guided in their orbits by angels. Water, it was universally believed, would not rise in a pump above a certain height because nature abhors a vacuum. Fossils, it was thought, were but outlines of future creations which the great Artificer had cast aside, or objects placed in the tilted and contorted strata of the earth "to bring to naught human curiosity."

The statements regarding animals found in the "Physiologus" and in the "Bestiaries," allegorical works much esteemed during the Middle Ages, were accepted as veritable facts, and believed as firmly as were the ludicrous stories of Pliny, the naturalist. For a thousand years and more, even those who

professed to teach natural history saw in the fables regarding the dragon and the unicorn, the phoenix and the basilisk, the hippogriff and the centaur, nothing to stagger their faith and nothing that was inconsistent with the science of the times. They believed without question that the phoenix rose from its ashes, that the pelican nourished its young with its blood, that the salamander could quench fire, that the basilisk killed serpents by its breath and men by its glance, and many similar things equally preposterous.

The frame of mind, even of the most intelligent men, was such, that the extraordinary tales of Marco Polo and Sir John Mandeville were credited as readily as the most ordinary facts of history or biography. It was indeed difficult to exaggerate the powers or marvels of animated nature to such an extent that they would be pronounced unworthy of credence. But the world has moved since the times of Polo and Mandeville. Science has made wondrous strides forward since the days of Kepler and Kircher. Men are

now more familiar with the laws and processes of the organic world, and have learned to recognize the value and necessity of careful observation on the part of the votaries of science.

And in proportion as our knowledge has widened, and become more precise, so likewise have our conceptions of nature and of the Deity's methods of work been modified and exalted. We no longer look upon God as an architect, a carpenter, an artificer; one who must plan and labor in a human fashion, as He was contemplated in the infancy of our race, when the knowledge of the universe was much more circumscribed than it is at present. We now regard Him as a Creator in the highest and truest sense of the term; as one who "protects and governs by His Providence all things which He hath made," and who "reacheth from end to end mightily and ordereth all things sweetly."

Science Not Omnipotent.

But although science has made marvelous advances during recent times,

especially during the present century, and although Evolution has contributed in a wonderful manner towards unifying what was before a heterogeneous mass of almost unintelligible facts, science is not omnipotent, nor is Evolution competent to furnish a key to all the mysteries of nature. To judge from the declarations of some of the best known representatives of modern thought, science was to replace religion and the Church, and to do far more for the welfare and elevation of humanity than the Gospel and its ministers are capable of effecting. Renan declares, that it is "science which will ever furnish man with the sole means of bettering his condition." Again he assures us, that "*to organize humanity scientifically* is the last word of modern science, its daring but legitimate aim." Science, we were told but a few decades ago, would suppress the supernatural, remove mysteries and explain miracles. It would tell us all about the origin of things; the world, life, sensation, rational thought. It would inform us about the origin of

society, language, morality, religion. It would throw light not only on the origin of man's body and soul, but also on his ultimate destiny. It would, in a word, frame for us a complete cosmology, a complete code of ethics, and introduce a new religion, which would be as superior to Christianity as science is superior to superstition. It promised that we should one day be able to "express consciousness in foot-pounds;" that we should be able to trace the connection between "the sentiment of love and the play of molecules;" that we should be in a position to discern "human genius and moral aspiration in a ring of cosmical vapor." Thanks to science and to its grand generalization, Evolution, old systems of thought were to be wiped out of existence, and we were to be ushered into an era of general enlightenment and universal progress.

But has science, as represented by Renan, Hæckel, and others of their way of thinking, made good its promises? Has it been able to dispense

with a personal God, and to relegate the supernatural to the limbo "where entities and quiddities, the ghosts of unknown bodies lie"? Has it, in the words of Virchow, succeeded in referring the origin of life to "a special system of mechanics," or in proving Renan's view that "the harmony of nature is but a resultant," and that "the existence of things is but an affair of equilibrium"? Has the religion which makes a God of humanity regarded in the abstract, or which evolves a Deity from the universe considered as a whole, rendered men better or happier? These are questions which press for an answer, but which, fortunately, can be answered as readily as they are asked.

The response to all these questions, collectively and severally, is a peremptory negative. It is the response which true philosophers and true men of science the world over have given all along. For it would be a mistake to imagine that the utterances of Renan, Hæckel, and their followers, have the indorsement of the worthier representa-

tives of science, or that true science has ever made the pretensions claimed for it by some of its self-constituted exponents and protagonists. There are soi-disant scientists and true scientists, as well as there is a sham science and a science deserving the name.

Bankruptcy of Science.

It was in speaking of such soi-disant scientists and their unfulfilled promises, of such sham science and its boastful pretensions, that a brilliant member of the French Academy, M. Brunetière, did not hesitate to declare recently that "science had become bankrupt." Science has promised to tell us whence we come, what we are, whither we are going; but it has signally and totally failed to give an answer to any of these questions.

Hellenists had engaged themselves to exhibit the whole of Christianity in the philosophy of Greece and Rome, and to pick out for us in the "Thoughts" of Marcus Aurelius, and the "Manual" of Epictetus, all the "scattered members"

of the Sermon on the Mount. But they did not succeed in this, and still less did they succeed in explaining why the Sermon on the Mount has conquered the world, and why the "Manual," and the "Thoughts" of Epictetus and Marcus Aurelius have always remained completely sterile.

Hebraists undertook to dissipate the "irrational" and "the marvelous," in the Bible; to exhibit it as a book like the "Iliad" or the "Mahabahrata," but the sum total of their researches has issued in the very opposite of what they anticipated, and their labors have had the effect of reintegrating what they had hoped to destroy.

Orientalists, in their turn, promised to deduce Christianity from Buddhism, and to prove that the teachings of Christ were drawn wholly, or in great part, from the doctrines of Buddha. Like the Hellenists and Hebraists, however, these orientalists failed completely to establish their thesis, and, far from throwing light on the subjects which they set out to clear up, they but plunged them into greater obscurity

and introduced new hypotheses instead of reaching positive and incontestable conclusions.

All along the line, the science of which we are speaking—the physical, natural, historical, and philological sciences—has shown itself incapable of giving an answer to the very questions which most interest us. And still more has it forfeited the claim, which it has made during the past hundred years, to frame laws for the government of mankind in lieu of those given by Christ and His Church. The consequence is that all thoughtful men are beginning to realize the fact, if they did not realize it before, that questions of free will and moral responsibility are not to be settled by physiology, nor are rules of conduct to be sought for in Evolution. Hence, if we are to live anything more than an animal life, we must have something higher than science is able to afford; we must be guided by the teachings of the Founder of Christianity, by the saving influence of that Church which, for well-nigh two thousand years, has shown herself the sole power capable of lifting

man from a lower to a higher moral and spiritual plane.

The net result, therefore, of a hundred years of aggressive warfare against the Church and religion, the outcome of all the flattering but misleading promises of science in the matters which we have been considering, have been the very opposite of those intended. M. Brunetière resumes the result in two words—and no well-informed person will, I think, be disposed to contradict his conclusions—these are: “Science has lost its prestige, and religion has recovered a portion of hers.”

M. Brunetière's study is pretty much in the same strain as Lord Salisbury's much discussed address at Oxford before the British Association for the Advancement of Science. And has not Huxley, one of the most applauded representatives of science, and one of the staunchest defenders of Evolution, been forced to admit, in his celebrated Romanes Lecture, that science and Evolution have limitations which he would have been loath to acknowledge but a few years before he made the confession

that so startled many of his scientific friends? The conclusion of this studied effort of the noted evolutionist is, briefly stated, that the cosmic process, or Evolution, is utterly incompatible with ethical progress, or rather, the two are ever and essentially antagonistic.

And Herbert Spencer, too, the great philosopher of Evolution, who sees the working of Evolution in everything; in the development of society, language, government, of worlds and systems of worlds, was obliged not long since to admit, not without reluctance we may be sure, that Evolution is not operating so rapidly as he expected it would, and is not fulfilling all the fond hopes he entertained regarding it as a factor of human progress. "My faith in free institutions," says he, "originally strong, though always formed with the belief that the maintenance and success of them is a question of popular character, has, in these later years, been greatly decreased by the conviction that the fit character is not possessed by any people, nor is likely to be possessed for ages to come."

Conquests of Science.

It would be a grave mistake, however, to imagine that, because science has become bankrupt in some things, she has lost her prestige entirely. Nothing could be farther from the truth. No one who is acquainted with the brilliant conquests of science during the present century, could entertain such an opinion for a moment. What M. Brunetière means, and what all those who indorse his statements mean, is that she has failed by attempting what was beyond her competence; by essaying to solve problems and effect reforms that lie entirely within the domain of religion and philosophy. She has erred by confounding empiricism with metaphysics, and become insolvent only by assuming liabilities that were manifestly outside of her sphere of action. But so long as she was content with her own methods, and confined her investigations to her own province, she made good all her promises, if she did not accomplish even more. A glance at the annals of science during the past few decades, to go back

no further, should satisfy the most skeptical on this point. She has given to the arts of life an impetus they never felt before. The forces of steam and electricity have received a development and been given applications that have been the marvel of the world. Nor has theoretical science in anywise failed to keep pace with the practical. Chemistry, biology, astronomy, physics, geology, aside from their practical applications, have wonderfully extended our views of the universe and given us far nobler conceptions both of nature and nature's God.

And, paradoxical as it may appear, not the least noble of these conceptions comes to us from that very theory which, only a few years ago, was supposed to have banished forever the Creator from the world of reality; a theory which was at once the scandal of the pious and the incubus of the orthodox. Evolution, it was asserted, had disproved the declarations of Scripture, and shown the inutility of a religion based on Dogma. It had dethroned the Almighty, had demonstrated that the universe is eternal,

and that the order and beauty which we everywhere behold is the result of a fortuitous concourse of atoms. There is, therefore, we are told, neither design nor purpose in nature, and the doctrine of final causes, on which theologians were wont to lay so much stress, is completely and forever discredited.

More mature reflection, however, shows that all these assertions are as rash as they are unwarranted. Never in the history of science have thoughtful students of nature felt more deeply the necessity of recognizing a personal Creator, a spiritual, intelligent First Cause, than at present. Never have men seen more clearly the necessity of religion, as the sole agency which is capable of elevating and saving human society from the countless dangers with which it is now beset. Never has the Divine character of the Book of books, been so gloriously manifested as it is now, after the many and furious onslaughts made on it in the name of science and the Higher Criticism. For, strange to say, the very investigations and discoveries which it was fondly

imagined would completely nullify all its claims to being a Divine revelation, far from destroying such claims have but strengthened them and rendered them more logical and consistent.

Evidences of Design and Purpose.

And as to the evidence of design and purpose in nature, it was never more strikingly conclusive. But believing in final causes does not imply, let it be borne in mind, that we can always discover what is the precise purpose which is to be subserved by any given creature or organ. God has not taken us into His counsels, and we can at best catch but glimpses of His Divine plans and purposes.

There are, undoubtedly, many ends and purposes to be answered in all created things, and those of which we can attain any knowledge may be the least important. As Mivart puts it:

“Out of many, say a thousand million, reasons for the institution of the laws of the physical universe, some few are to a certain extent conceivable by us; and amongst these the benefits, material and

moral, accruing from them to men—and to each individual man in every circumstance of his life—play a certain, perhaps a very subordinate, part.”

The existence of an intelligent First Cause necessarily supposes that all forms of organization must be purposeful, once such forms exist, just as a world full of design manifestly proclaims the existence of a Designer.

Again, there are some who seem to think, if they can but find out how a law of nature operates, or what may be one of the many millions of purposes which an individual structure may serve, they have thereby eliminated the action of Providence, or shown it to be non-existent. They conclude that because, forsooth, they understand how a thing is done, that God did not do it. “No matter how wonderful, how beautiful, how intimately complex and delicate has been the machinery which has worked, perhaps for centuries, perhaps for millions of ages, to bring about some beneficent results, if they can but catch a glimpse of the wheels, its Divine character disappears.”

In marked contrast with the opinions of sciolists and professed monists, respecting design and purpose in nature, is the view entertained by one of the ablest living masters of science, Lord Kelvin.

"I feel profoundly convinced," he declares, "that the argument of design has been greatly too much lost sight of in recent zoölogical speculations. Overpoweringly strong proofs of intelligent and benevolent design lie around us, and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing to us, through nature, the influence of a free will, and teaching us that all living things depend on one everlasting Creator and Ruler."

No, the argument from design has not been invalidated; it has been modified. It has not been weakened; it has been strengthened and expanded. Teleology to-day is not, indeed, the same as it was in Paley's time, nor as it was when the authors of the *Bridgewater Treatises* lived and labored. It is now a more comprehensive, a more beautiful, and a more stimulating science. To Paley, a

watch found on the heath by a passing traveler, was evidence of design and of a designer. To the evolutionist, the evidence of design is not merely a watch, but a watch which is capable of producing other and better watches. To Paley, God was an Artificer who fashioned things directly from the materials at hand; to the evolutionist, as to St. Athanasius, St. Gregory of Nyssa and St. Augustine, God is a Creator who makes things make themselves. To Paley, as to the older school of natural theologians, God was the direct cause of all that exists; to the evolutionist he is the Cause of causes—*Causa causarum*, of the world and all it contains. According to the older view, God created everything directly and in the condition in which it now exists; according to Evolution, creation, or development rather, has been a slow and gradual process, demanding untold æons for converting chaos into a cosmos, and for giving to the visible universe all the beauty and harmony which it now exhibits. It seems, indeed, more consonant with our ideas of God, to Whom a

thousand years are as one day and one day as a thousand years, to conceive Him as creating all things in the beginning, and in ordering and administering them afterwards through the agency of secondary causes, rather than to represent Him as perpetually taking up a work which He had left unfinished, and bringing it to a state of perfection only by a long series of interferences and special creations. Understood in this, its true sense, Evolution teaches, as Temple phrases it, that the execution of God's "purpose belongs more to the original act of creation, less to acts of government. There is more Divine foresight, there is less Divine interposition; and whatever has been taken from the latter has been added to the former."

Evolution, Scripture and Theology.

Evolution accentuates design, without which, as Von Hartmann observes, all were "only a dark chaos of obstinate and capricious forces." It gives a truer and more majestic account of causation, because it brings home to us the truth,

that the facts of nature are the acts of God, and emphasizes the teaching of our faith, that the laws of nature are the expressions of "a supreme will and purpose belonging to an Eternal Mind."

Evolution has been denounced as anti-Scriptural, and yet, the most remarkable feature about the Genesiac account of creation, is the ease with which it lends itself to the theory of Evolution, that is, of creation by the operation of secondary causes. We may not, indeed, be prepared to assert with Naudin, that "the cosmogony of the Bible from the beginning to the end is but an Evolution theory, and that Moses is the ancestor of Lamarck, Darwin and all modern evolutionists," but we can certainly affirm, as Canon Hamard points out, that the Sacred Text favors Transformism when understood in a theistic sense — "*le texte sacré favorise à certains égards la thèse transformiste entendue dans un sens spiritualiste.*"

Evolution has been condemned as anti-Patristic and anti-Scholastic, although Saints Gregory of Nyssa, Au-

gustine and Thomas Aquinas, are most explicit in their assertion of principles that are in perfect accord with all the legitimate demands of theistic Evolution. It suffices to recall the admirable passage of the Bishop of Hippo, in his "De Genesi ad Litteram," in which he proleptically announced all the fundamental principles of modern Evolution. He recognized Evolution not only in individuals, but he also discerned its workings in the sum of all things. God did not create the world, as it now exists, actually, *actualiter*, but potentially and causally, *potentialiter et causaliter*. Plants and animals were created virtually, *vi potentiaque causati*, before they received their subsequent development, *priusquam per temporum moras exorirentur*.

Evolution and Special Creation.

In reference to the popular objections against Evolution that it reposes on no positive demonstration; that none of the arguments advanced in its behalf are conclusive; that all of them, whether taken severally or collectively are vi-

tiated by some flaw, and that, consequently, they are not of such a character as to command the assent of reasonable men, it may be observed that all of them can be urged with equal, and even with greater force against the rival of the Evolution theory, to wit, the theory of special creation.¹ Contrary to what its supporters would be disposed to admit, it has no foundation but assumption, and can claim no more substantial basis than certain postulates which are entirely gratuitous, or certain views regarding the Genesiac account of creation, the truth of which views may as readily and with as much reason be denied as it can be affirmed. For as the learned Abbé Guillemet declared before a sympathetic audience, composed of distinguished ecclesiastics and scholarly laymen, at the International Catholic Scientific Congress at Brussels,

¹ According to the theory of special creation as formerly held, everything in the inorganic, as well as in the organic world, was created by God directly and essentially as it now appears. But as at present understood, special creation means rather that the Deity created immediately all the species and higher groups, of animals and plants, as they now exist.

the theory of special creation, or fixism as he prefers to call it, explains nothing whatever in science. Not only this, "it closes the door to all explanations of nature, and notably so in the domain of paleontology, comparative anatomy, embryology and teratology. It affords no clue to the significance of rudimentary organs, and tends inevitably to force science into a veritable cul-de-sac."

Again, it may be observed that the objections referred to are based not only on a misapprehension of the significance of the theory of Evolution, as well as that of the theory of special creation, but also on a misconception of the character of the arguments which are urged in favor of both theories. The misapprehension arises from the fact, that Evolution is regarded as being at best but a flimsy hypothesis, while special creation is represented as a positive dogma, which admits neither of doubt nor of controversy. The truth is, however, that both Evolution and special creation are theories, and no one who is exact in the use of language can truth-

fully assert that either of them is anything more. Evolution, I know, is oftentimes called a proved doctrine; but no evolutionist who has any regard for accuracy of terminology would pretend that the theory has passed all the requirements of a rigid demonstration, because he knows better than anyone else, that anything approaching a mathematical demonstration of Evolution is an impossibility. The most that the evolutionist can hope for or that he has hitherto attained, or is likely to attain, at least for a long time to come, is a certain degree of probability; but such a degree of probability as shall give his theory sufficient weight to command the assent of anyone who is competent to estimate the value of the evidence offered in its support. The degree of probability which already attaches to the theory of Evolution is very great, as all who have taken the trouble to investigate its claims must admit; and every new discovery in the realms of animate nature but contributes towards placing the theory on a firmer and more impregnable basis.

Such being the case the question now is: Which of the two theories is the more probable, Evolution or special creation? Both of them, it must be admitted, rest upon a certain number of postulates; both of them have much to be said in their favor, as both of them may be assailed with numerous and serious objections. For our present purpose it will here suffice to repeat the answer of the Abbé Guillemet, who tells us that Evolution, as against special creation, has this in its favor, that it explains and coördinates the facts and phenomena of nature in a most beautiful and simple manner; whereas the theory of special creation not only explains nothing and is incapable of explaining anything, but, by its very nature, tends to impede research, to bar progress, or as he phrases it, "*it forces science into a blind alley—met la science dans une impasse.*"

**Genesis: Days, Flood, Fossils and
Antiquity of Man.**

As matters now stand, the case of special creation *versus* Evolution is analogous to several other questions which

have supplied materials for long and acrimonious controversy. Thus, until the last century it was the almost universally accepted belief that the days of Genesis were real solar days of twenty-four hours each. It was likewise the general opinion that the Noachian Deluge was universal, not only as to the earth's surface but also as to the destruction "of all flesh, wherein is the breath of life, under heaven." And until a few decades ago it was the current belief, that the advent of our race on earth did not date back much farther than four thousand years B. C., and that the only reliable evidence we had for the solution of the problem involved, was to be found in certain statements of the Sacred Text. So, too, from the time of Aristotle until that of Palissy the potter, we might say even until the time of Cuvier, it was believed that fossils were but "sports of nature," "results of seminal air acting upon rocks," or "rejected models" of the Creator's work.

Now it would probably be difficult, if not impossible, to give an absolute

proof of the unsoundness of these views, and that for the simple reason that anything like a mathematical demonstration is, by the very nature of the case, out of question. Rigorously speaking, the theories involved in the above beliefs, with the exception, perhaps, of that regarding the antiquity of man, are susceptible neither of proof nor of disproof. The most we can have, at least for the present, is a greater or less degree of probability, for it is manifest that the Almighty, had He so willed, could have created the world as it now is in six ordinary days. He could have created it just as it exists at present in a single instant, for He is above and independent of time. The teachings, however of geology and paleontology are diametrically opposed to the supposition that He did fashion this globe of ours, as we now see it, in six ordinary days, while it is found that there is nothing in Scripture which precludes the view that the days of Genesis were indefinite periods of time. God could have caused the flood to cover the entire earth to the height of the highest mountain, and He

could thus have destroyed every living thing except what was preserved in the ark; but did He? Ethnology, linguistics, prehistoric archæology, and even Scripture, supply us with practically conclusive reasons for believing that He did not. It is within the range of possibility, that the four thousand and four years allowed by Usher for the interval which elapsed between the creation of Adam and the birth of Christ, are ample to meet the demands of the case, but it is in the highest degree improbable. If the evidence of history, archæology, and cognate branches of science have any value at all, it is almost demonstrably certain that the time granted by Usher and his followers is entirely inadequate to meet the many difficulties which modern science has raised against the acceptance of such a limited period since man's advent on earth. And, so, too, regarding fossils. God could, undoubtedly, have created them just as they are found in the earth's crust, but there is no reason for believing that He did so, while there are many and grave reasons for thinking that He

did not. In the first place all *prima facie* evidence is against it. It is contrary to the known analogy of the Creator's methods of work in other instances; contrary to what is a rational conception of the Divine economy in the plan of creation. It is contrary also to our ideas of God's wisdom and goodness; for to suppose that fossils are not the remains of forms of life now extinct, to suppose that they were created as we now find them, would be to suppose that the Creator would have done something which was specially designed to mislead and deceive us. Against such a view we can assert what Suarez affirms in another connection, that God would not have designedly led us into error—*Incredibile est, Deum . . . illis verbis ad populum fuisse locutum quibus deciperetur*. We see fossils now forming, and from what we know of the uniformity of nature's operations we conclude that in the past, and during the lapse of long geologic eras, fossils have been produced through the agency of natural causes as they are produced at present, and that, consequently, they were not created

directly and immediately during any of the Genesiac days, days of twenty-four hours each, as was so long and so universally believed even by the wisest theologians and philosophers.

What has been said of the traditional views respecting the six days of creation, the Noachian Deluge, the antiquity of the human race and the nature and age of the fossil remains entombed in the earth's crust, may, in a great measure, be iterated regarding the long-accepted view of special creation.¹ It is possible, for there is nothing in it intrinsically absurd; but in the light afforded by the researches and discoveries of these latter days, it is the conviction of the great majority of those who have studied the question with the greatest care, and who are the most competent to interpret the facts involved, that as between the two rival theories, special creation and Evolution, the preponderance of probability is overwhelming in favor of

¹For an extended discussion of the Genesiac days, the Noachian deluge, the antiquity of man and the origin of fossils, see "Bible, Science and Faith," and "Evolution and Dogma," Part I.

Evolution of some kind, but of just what kind only the future can determine.

Evolution, then, I repeat it, is *contrary* neither to reason nor to Scripture. And the same may be said of the divers theories of Evolution which, during these latter times, have had such a vogue. Whether, therefore, we accept the theory of extraordinary births, the saltatory Evolution of Saint-Hilaire and St. George Mivart; or Darwin's theory of natural selection, which takes account of only infinitesimal increments; or Weismann's theory of heredity, which traces specific changes to the germ-plasm, we are forced to admit that the ultimate efficient Cause of all the changes produced, be they slow or sudden, small or great, is the Creator Himself, acting through the agency of second causes, through the forces and virtues which He Himself communicated to matter in the beginning. Such being the case, it is obvious that Evolution does not exclude creation, and that creation is not incompatible with Evolution.

Strictly speaking, Evolution, whether it progress by saltation or by minute and fortuitous increments, as we are wont to regard them, is, in the last resort, a kind of special creation, and, reason as we may, we can view it in no other light. The same may be said of spontaneous generation, or the Evolution of organic from inorganic matter. For secondary or derivative creation implies Evolution of some kind, as Evolution, whether rapid or operating through untold æons, demands, in the last analysis, the action of intelligence and will, and presupposes what is termed creation in a restricted sense, that is, formation from preëxisting material. Our primary intuitions, especially our ideas of causation, preclude us from taking any other view in the premises. As reason and revelation teach, it was God who created the materials and forces which made Evolution possible. "It was Mind," as Anaxagoras saw, "that set all things in order"—*πάντα διεκόσμησε νόος*; that from chaos educed a cosmos and gave to the earth all that infinitude of variety and beauty

and harmony which we so much admire.

But not only is Evolution a theory which is in perfect accordance with science and Scripture, with Patristic and Scholastic theology; it is likewise a theory which promises soon to be the generally accepted view; the view which will specially commend itself not only to Christian philosophy, but also to Christian apologetics as well. We have seen some indications of this in the already quoted opinions of such eminent Catholic authorities as Monsabré, D'Hulst, Leroy, De Lapparent and St. George Mivart.

Eminent Catholics on Evolution.

Geoffroy Saint-Hilaire, Cuvier's great rival, and a man of profound religious sentiments, looked upon the succession of species, as disclosed by Evolution, as "one of the most glorious manifestations of creative power, and a fresh motive for admiration and love." The noted Belgian geologist, D'Omalus d'Halloy, as distinguished for his loyalty to the

Church as for his eminence in science, declares:

“It appears to me much more probable and more conformable to the eminent wisdom of the Creator, to admit that, just as He has given to living beings the faculty of reproducing themselves, so, likewise, has He endowed them with the power of modifying themselves according to circumstances, a phenomenon of which nature affords us examples even at present.”

Commenting on this question, the learned Belgian Jesuit, Father Belinck, asks:

“What matters it if there have been creations prior to that which Moses described; what matters it whether the periods required for the genesis of the universe were days or epochs; whether the apparition of man on the earth was at an earlier or later date; whether animals have preserved their primitive forms, or whether they have undergone gradual transformations; whether even the body of man has experienced modifications, and, finally, what matters it whether, in virtue of the Creative Will, inorganic matter be able or not to produce plants and animals spontaneously?

“All these questions are given over to the disputes of men, and it is for science to distinguish truth from error.”

These are pertinent questions. What matters it, indeed, from the standpoint of Catholic Dogma, if they are all answered in the affirmative? If science should eventually demonstrate that spontaneous generation is probable, or has actually occurred, or is occurring in our own day, what matters it? The Fathers and Schoolmen found no difficulty in believing in abiogenesis, and most of them, if not all of them, believed in it so far as it concerned the lower forms of life. More than this. As we learned in the beginning of our work, spontaneous generation was almost universally accepted until about a century ago. Materialists then thought themselves that abiogenesis might be urged as an argument in favor of Materialism. Theologians, in their eagerness to answer the objection, denied the fact instead of denying the inference. Later on, men of science discovered that so far as evidence goes

abiogenesis is not a fact, and, still later, it dawned upon a few theologians that whether a fact or not, it is quite immaterial so far as theology is concerned. Whether not-living matter may ever give rise to living matter, science is unable to state with absolute certainty, but should it ultimately be shown that spontaneous generation is a fact, we should simply say with the Fathers and Doctors of the Church: The Creator gave to inorganic matter the power, under suitable conditions, of evolving itself into organic matter, and thus science and Dogma would be in harmony.

**Faith Has Nothing to Apprehend from
Evolution.**

Suppose, then, that a demonstrative proof of the theory of Evolution should eventually be given—a proof such as would satisfy the most exacting and the most skeptical—it is evident, from what has already been stated, that Catholic Dogma would remain absolutely intact and unchanged. Individual theorists would be obliged to accommodate their

views to the facts of nature, but the doctrines of the Church would not be affected in the slightest. The hypothesis of St. Augustine and St. Thomas Aquinas would then become a thesis, and all reasonable and consistent men would yield ready, unconditional and unequivocal assent.

And suppose, further, that in the course of time science shall demonstrate—a most highly improbable event—the animal origin of man as to his body. There need, even then, be no anxiety so far as the truths of faith are concerned. Proving that the body of the common ancestor of humanity is descended from some higher form of ape, or from some extinct anthropopithecus, would not necessarily contravene either the declarations of Genesis, or the principles regarding derivative creation which found acceptance with the greatest of the Church's Fathers and Doctors.

Mr. Gladstone, in his admirable introduction to the "People's Bible History," expresses the same idea with characteristic force and lucidity.

“If,” he says, “while Genesis asserts a separate creation of man, science should eventually prove that man sprang, by a countless multitude of indefinitely small variations, from a lower, and even from the lowest ancestry, the statement of the great chapter would still remain undisturbed. For every one of those variations, however minute, is absolutely separate, in the points wherein it varies, from what followed and also from what preceded it; is in fact and in effect a distinct or separate creation. And the fact that the variation is so small that, taken singly, our use may not be to reckon it, is nothing whatever to the purpose. For it is the finiteness of our faculties which shuts us off by a barrier downward, beyond a certain limit, from the small, as it shuts us off by a barrier upward from the great; whereas for Him whose faculties are infinite, the small and the great are, like the light and the darkness, ‘both alike,’ and if man came up by innumerable stages from a low origin to the image of God, it is God only who can say, as He has said in other cases, which of those stages may be worthy to be noted with the distinctive name of creation, and at what point of the ascent man could first be justly said to exhibit the image of God.”

But the derivation of man from the ape, we are told, degrades man. Not at all. It would be truer to say that such derivation ennobles the ape. Sentiment aside, it is quite unimportant to the Christian "whether he is to trace back his pedigree directly or indirectly to the dust." St. Francis of Assisi, as we learn from his life, "called the birds his brothers." Whether he was correct, either theologically or zoologically, he was plainly free from that fear of being mistaken for an ape which haunts so many in these modern times. Perfectly sure that he, himself, was a spiritual being, he thought it at least possible that birds might be spiritual beings, likewise incarnate like himself in mortal flesh; and saw no degradation to the dignity of human nature in claiming kindred lovingly with creatures so beautiful, so wonderful, who, as he fancied, "praised God in the forest, even as angels did in heaven."

Misapprehensions Regarding Evolution.

Many, it may here be observed, look on the theory of Evolution with suspicion,

because they fail to understand its true significance. They seem to think that it is an attempt to account for the origin of things when, in reality, it deals only with their historical development.

It deals not with creation, with the origin of things, but with the *modus creandi* or, rather, with the *modus formandi*, after the universe was called into existence by Divine Omnipotence. Evolution, then, postulates creation as an intellectual necessity, for if there had not been a creation there would have been nothing to evolve, and Evolution would, therefore, have been an impossibility.

And for the same reason, Evolution postulates and must postulate, a Creator, the sovereign Lord of all things, the Cause of causes, the *terminus a quo* as well as the *terminus ad quem* of all that exists or can exist. But Evolution postulates still more. In order that Evolution might be at all possible it was necessary that there should have been not only an antecedent creation *ex nihilo*, but also that there should have been an antecedent involution, or

a creation *in potentia*. To suppose that simple brute matter could, by its own motion or by any power inherent in matter as such, have been the sole efficient cause of the Evolution of organic from inorganic matter, of the higher from the lower forms of life, of the rational from the irrational creature, is to suppose that a thing can give what it does not possess, that the greater is contained in the less, the superior in the inferior, the whole in a part.

No mere mechanical theory, therefore, however ingenious, is competent to explain the simplest fact of development. Not only is such a theory unable to account for the origin of a speck of protoplasm, or the germination of a seed, but it is equally incompetent to assign a reason for the formation of the smallest crystal or the simplest chemical compound. Hence, to be philosophically valid, Evolution must postulate a Creator not only for the material which is evolved, but it must also postulate a Creator, *Causa causarum*, for the power or agency which makes any development possible. God, then, not

only created matter in the beginning, but He gave it the power of evolving into all forms it has since assumed or ever shall assume.

But this is not all. In order to have an intelligible theory of Evolution, a theory that can meet the exacting demands of a sound philosophy as well as of a true theology, still another postulate is necessary. We must hold not only that there was an actual creation of matter in the beginning, that there was a potential creation which rendered matter capable of Evolution, in accordance with the laws impressed by God on matter, but we must also believe that creative action and influence still persist, that they always have persisted from the dawn of creation, that they, and they alone, have been efficient in all the countless stages of evolutionary progress from atoms to monads, from monads to man.

This ever-present action of the Deity, this immanence of His in the work of His hands, this continuing in existence and developing of the creatures He has made, is what St. Thomas calls the "Divine

administration," and what is ordinarily known as Providence. It connotes the active and constant coöperation of the Creator with the creature, and implies that if the multitudinous forms of terrestrial life have been evolved from the potentiality of matter, they have been so evolved because matter was in the first instance proximately disposed for Evolution by God Himself, and has ever remained so disposed. To say that God created the universe in the beginning, and that He gave matter the power of developing into all the myriad forms it subsequently exhibited, but that after doing this He had no further care for what He had brought into existence, would be equivalent to indorsing the Deism of Hume, or to affirming the old pagan notion according to which God, after creating the world, withdrew from it and left it to itself.

As to man, Evolution, far from depriving him of his high estate, confirms him in it, and that, too, by the strongest and noblest of titles. It recognizes that although descended from humble lineage, he is "the beauty of the world,

and the paragon of animals;" that although from dust—tracing his lineage back to its first beginnings—he is of the "quintessence of dust." It teaches, and in the most eloquent language, that he is the highest term of a long and majestic development, and replaces him "in his old position of headship in the universe, even as in the days of Dante and Aquinas."

Evolution an Ennobling Conception.

And as Evolution ennobles our conceptions of God and of man, so also does it permit us to detect new beauties, and discover new lessons, in a world that, according to the agnostic and monistic views, is so dark and hopeless. To the one who says there is no God, "the immeasurable universe," in the language of Jean Paul, "has become but a cold mass of iron, which hides an eternity without form and void."

To the theistic evolutionist, however, all is instinct with invitations to a higher life and a happier existence in the future; all is vocal with hymns of praise

and benediction. Everything is a part of a grand unity betokening an omnipotent Creator. All is foresight, purpose, wisdom. We have the entire history of the world and of all systems of worlds, "gathered, as it were, into one original, creative act, from which the infinite variety of the universe has come, and more is coming yet." And God's hand is seen in the least as in the greatest. His power and goodness are disclosed in the beauteous crystalline form of the snowflake, in the delicate texture, fragrance and color of the rose, in the marvelous pencilings of the butterfly's wing, in the gladsome and melodious notes of the lark and the thrush, in the tiniest morning dewdrop with all its gorgeous prismatic hues and wondrous hidden mysteries. All are pregnant with truths of the highest order, and calculated to inspire courage, and to strengthen our hope in faith's promise of a blissful immortality.

The Divine it is which holds all things together: *περιεχέει τό θεῖον τήν ὅλην φύσιν*. So taught the old Greek philosophy as reported by the most gifted of her

votaries. And this teaching of the sages of days long past, is extended and illuminated by the far-reaching generalization of Evolution, in a manner that is daily becoming more evident and remarkable. But what Greek philosophy faintly discerned, and what Evolution distinctly enunciates, is rendered gloriously manifest by the declaration of revealed truth, and by the doctrines of Him who is the Light of the world.

Science and Evolution tell us of the transcendence and immanence of the First Cause, of the Cause of causes, the Author of all the order and beauty in the world, but it is revelation which furnishes us with the strongest evidence of the relations between the natural and supernatural orders, and brings out in the boldest relief the absolute dependence of the creature on its Maker. It is faith which teaches us how God "binds all together into Himself;" how He quickens and sustains "each thing separately, and all as collected in one."

I can, indeed, no better express the ideas which Evolution so beautifully shadows forth, nor can I more happily

conclude this long discussion than by appropriating the words used long ago by that noble champion of the faith, St. Athanasius.

“As the musician,” says the great Alexandrine Doctor, in his “*Oratio Contra Gentiles*,” “having tuned his lyre, and harmonized together the high with the low notes, and the middle notes with the extremes, makes the resulting music one; so the Wisdom of God, grasping the universe like a lyre, blending the things of air with those of earth, and the things of heaven with those of air, binding together the whole and the parts, and ordering all by His counsel and His will, makes the world itself and its appointed order one in fair and harmonious perfection; yet, He, Himself, moving all things, remains unmoved with the Father.”

REFERENCES



- ARGYLL, DUKE OF (8th) "The Unity of Nature.
ARISTOTLE, "Physics;" "History of Animals;"
"Metaphysics."
ATHANASIUS, ST., "Oratio Contra Gentiles."
AUGUSTINE, ST., "De Trinitate;" "De Genesi ad
Litteram;" "De Libero Arbitrio;" "De Anima
et ejus Origine;" "Retractationes."
BACON, FRANCIS, Lord, "Novum Organum."
BARRY, ALFRED, "Some Lights of Science on the
Faith."
BELLINCK, FATHER, S. J., art. in "Études Histor-
iques et Littéraires."
BRUNETIÈRE, FERDINAND, art. in *Revue des Deux
Mondes*.
BÜCHNER, F. KARL, "Force and Matter;" "Man
in the Past, Present and Future."
CLARKE, FATHER, S. J., arts. in *The Month*.
CORLUIY, Rev. J., S. J., "Specilegium Dogmatico-
Biblicum."
DARWIN, CHARLES, "The Origin of Species;" "Ani-
mals and Plants Under Domestication."
DAWSON, Sir J. W., "Story of the Earth and
Man."
FISKE, Prof. JOHN, "Outlines of Cosmic Philoso-
phy;" "The Idea of God."
GAUDRY, ALBERT, "Les Enchaînements du Monde
Animal dans les Temps Géologiques."
GLADSTONE, W. E., Introduction to "People's Bible
History."
GONZALES, Cardinal, "La Biblia y la Ciencia."
GRAY, Prof. ASA, "Darwiniana."
GREGORY OF NYSSA, ST.
GUILLEMET, ABBÉ, "Pour la Théorie des Ancêtres
Communs;" various "Comptes Rendus."
HÆCKEL, ERNST, "The Evolution of Man;" "Con-
fessions of a Man of Science;" "Universal
Morphology."

- HAMARD, Canon, French savant and apologist.
- HARPER, Father T. N., S. J., "Metaphysics of the School."
- HOLY BIBLE.
- HUXLEY, Prof. T. H., "Lectures on Evolution;" "Science and Hebrew Tradition;" "Classification;" "Life and Letters of Ch. Darwin;" "Science and Christian Tradition;" "Collected Essays;" art. "Biology" in *Encyclopædia Britannica*.
- JAUGEY, ABBÉ J. B., "Dictionnaire Apologétique de la Foi Catholique."
- KELVIN, Lord (Sir WILLIAM THOMSON), Scotch physicist, Address at Edinburgh.
- LACTANTIUS, "De Ira Dei."
- LAMARCK, J. B. DE, "Histoire Naturelle;" "Philosophie Zoologique."
- LENORMANT, FRANÇOIS, "Origines de l'Histoire d'après la Bible."
- LEO XIII, Pope, Encyclicals "Æterni Patris;" and "Providentissimus Deus."
- LEROY, Père, "L'Évolution Restreinte aux Espèces Organiques."
- MCCOSH, Dr. JAMES, "Religious Aspect of Evolution."
- MARTINEAU, Rev. JAS., D.D., "A Plea for Philosophical Studies;" "Science, Nescience and Faith."
- MIVART, ST. GEORGE, "Genesis of Species;" "On Truth;" "Lessons from Nature."
- MONSABRÉ, Père P. J., O. S. D., French theologian.
- MOORE, AUBREY L., "Science and Faith."
- MÜLLER, F. MAX, German-English philologist.
- NADAILLAC, MARQUIS DE, "Le Problème de la Vie;" "Progrès de l'Anthropologie," etc., in *Comptes Rendus*.
- NEWMAN, Cardinal JOHN HENRY, "Lectures on University Subjects."
- PALEY, "Natural Theology."
- QUATREFAGES, J. L. DE, "Darwin et ses Précurseurs Français;" "The Human Species," in *Journal des Savants*.
- RENAN, ERNEST, "L'Avenir de la Science."
- ROMANES, Prof. GEORGE, "Thoughts on Religion."
- ROSMINI, Padre, "Psychology."
- RUSKIN, JOHN, "Aratra Pentelici."
- SAINT-HILAIRE, E. GEOFFROY, "Histoire Générale et Particulière des Anomalies de l'Organisation chez l'Hommes."

- SENECA, "De Beneficiis;" "Naturales Quæstiones."
- SPENCER, HERBERT, "First Principles;" "Principles of Biology."
- TEMPLE, FREDERICK, "Bampton Lectures."
- TERTULLIAN.
- THOMAS, ST., of Aquin, "Summa;" "Opusculi."
- UEBERWEG, FRIEDRICH, "History of Philosophy."
- VATICAN COUNCIL, "Dogmatic Constitution of the Catholic Church."
- VIRCHOW, Prof. RUDOLF, Address before International Archæological Congress, at Moscow.
- WALLACE, ALFRED R., "Darwinism;" "Natural Selection."
- WHEWELL, WILLIAM, "History of the Inductive Sciences."
- ZAHM, J. A., "Bible, Science and Faith;" "Evolution and Dogma."
- ZELLER, EDWARD, "Philosophy of the Greeks."
- ZIGLIARA, Cardinal.



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